

THE MIRACLE OF HORMONES

HARUN YAHYA

September 2003

First published in 2003
©Goodword Books, 2003

Goodword Books
I, Nizamuddin West Market,
New Delhi 110 013
Tel. 9111-2435 5454, 2435 6666
Fax. 9111-2435 7333, 2435 7980
e-mail: info@goodwordbooks.com
website: www.goodwordbooks.com

ISBN
8178982250

Translated by Ron Evans
Edited by Jerry Bergman

Printed in India

www.harunyahya.com

INTRODUCTION

THE TWO GOVERNORS OF OUR BODY:

THE HYPOTHALAMUS AND THE PITUITARY GLAND

Your Body's Hidden Manager: The Hypothalamus

The Conductor of the Hormone Orchestra: The Pituitary Gland

The Hormones Secreted by the Pituitary Gland

The Anterior Pituitary Gland

The Posterior Pituitary Gland

The Miracle of Growth: The Growth Hormone

The Prolactin Hormone

The Oxytocin Hormone

The Wonder of Mother's Milk: The Prolactin and Oxytocin Hormones at Work

The System That Regulates the Amount of Fluid in the Blood: The Antidiuretic Hormone

Hormones That Are Able to Regulate Time and Produce the Differences Between the Sexes

THE RHYTHM OF LIFE: THE THYROID GLAND

The Proportion in Our Bodies

One Hundred Trillion Micro-Heaters

A Delicate Control Mechanism

Four Out of Ten Thousand Molecules

THE SENSITIVE CALCIUM-METERS

Taking the Necessary Steps

A Control Mechanism

THE SUGAR FACTORY IN OUR BODIES

THE ADRENAL GLANDS

The Fight or Flight System

Ten Million People and One Gram of the Hormone Aldosterone

A Flawless Planning

A Miraculous Medicine (Cortisol)

The Functions of Cortisol

SEX HORMONES

The Female Reproductive System

A Four Week Period of Life

Preparations to Meet the Egg Cell

The Male Reproductive System

Two Different Sexes From the Same Raw Material

COMMUNICATION WITHIN THE CELL

The Communications Center in a Cell and Its Stations
The Journey of a Message-Carrying Hormone Inside the Cell
Modular Communication Stations
The Control Mechanism in the Communication Within Cells
Special Messengers in the Cells
The Scientific World and Cellular Communication

THE ZIP CODE SYSTEM WITHIN CELLS

How is Protein Traffic Within Cells Organized?
The SRP Structure: The Guide in the Cell
Communication and Transportation in the Nucleus
Unique Systems Whose Secrets Have Not Yet Been Discovered

COMMUNICATION IN NERVE CELLS

Design in the Synapses
Chemical Communication in Neurons
The Planning and Timing in the Messenger Molecules
The Electrical Communication Between Neurons
An Evident Fact

A WONDERFUL MESSENGER: NITRIC OXIDE

Design in Our Blood Vessels
The Short Story of the Messenger NO
The Production Facility For Nitric Oxide: The Endothelium Cell
The Messenger in Sperm
Face to Face With Bacteria and Viruses

CONCLUSION

THE DECEPTION OF EVOLUTION

ABOUT THE AUTHOR

Now writing under the pen-name of HARUN YAHYA, he was born in Ankara in 1956. Having completed his primary and secondary education in Ankara, he studied arts at Istanbul's Mimar Sinan University and philosophy at Istanbul University. Since the 1980s, he has published many books on political, scientific, and faith-related issues. Harun Yahya is well-known as the author of important works disclosing the imposture of evolutionists, their invalid claims, and the dark liaisons between Darwinism and such bloody ideologies as fascism and communism.

His pen-name is a composite of the names Harun (Aaron) and Yahya (John), in memory of the two esteemed Prophets who fought against their people's lack of faith. The Prophet's seal on the his books' covers is symbolic and is linked to the their contents. It represents the Qur'an (the final scripture) and the Prophet Muhammad (peace be upon him), last of the prophets. Under the guidance of the Qur'an and the Sunnah (teachings of the Prophet), the author makes it his purpose to disprove each fundamental tenet of godless ideologies and to have the "last word," so as to completely silence the objections raised against religion. He uses the seal of the final Prophet, who attained ultimate wisdom and moral perfection, as a sign of his intention to offer the last word.

All of Harun Yahya's works share one single goal: to convey the Qur'an's message, encourage readers to consider basic faith-related issues such as God's Existence and Unity and the hereafter; and to expose godless systems' feeble foundations and perverted ideologies.

Harun Yahya enjoys a wide readership in many countries, from India to America, England to Indonesia, Poland to Bosnia, and Spain to Brazil. Some of his books are available in English, French, German, Spanish, Italian, Portuguese, Urdu, Arabic, Albanian, Russian, Serbo-Croat (Bosnian), Polish, Malay, Uyghur Turkish, and Indonesian.

Greatly appreciated all around the world, these works have been instrumental in many people recovering faith in God and gaining deeper insights into their faith. His books' wisdom and sincerity, together with a distinct style that's easy to understand, directly affect anyone who reads them. Those who seriously consider these books, can no longer advocate atheism or any other perverted ideology or materialistic philosophy, since these books are characterized by rapid effectiveness, definite results, and irrefutability. Even if they continue to do so, it will be only a sentimental insistence, since these books refute such ideologies from their very foundations. All contemporary movements of denial are now ideologically defeated, thanks to the books written by Harun Yahya.

This is no doubt a result of the Qur'an's wisdom and lucidity. The author modestly intends to serve as a means in humanity's search for God's right path. No material gain is sought in the publication of these works.

Those who encourage others to read these books, to open their minds and hearts and guide them to become more devoted servants of God, render an invaluable service.

Meanwhile, it would only be a waste of time and energy to propagate other books that create confusion in people's minds, lead them into ideological chaos, and that clearly have no strong and precise effects in removing the doubts in people's hearts, as also verified from previous experience. It is impossible for books devised to emphasize the author's literary power rather than the noble goal of saving people from loss of faith, to have such a great effect. Those who doubt this can readily see that the sole aim of Harun Yahya's books is to overcome

disbelief and to disseminate the Qur'an's moral values. The success and impact of this service are manifested in the readers' conviction.

One point should be kept in mind: The main reason for the continuing cruelty, conflict, and other ordeals endured by the vast majority of people is the ideological prevalence of disbelief. This can be ended only with the ideological defeat of disbelief and by conveying the wonders of creation and Qur'anic morality so that people can live by it. Considering the state of the world today, leading into a downward spiral of violence, corruption and conflict, clearly this service must be provided speedily and effectively, or it may be too late.

In this effort, the books of Harun Yahya assume a leading role. By the will of God, these books will be a means through which people in the twentyfirst century will attain the peace, justice, and happiness promised in the Qur'an.

TO THE READER

A special chapter is devoted to the collapse of the theory of evolution because this theory constitutes the basis of all anti-spiritual philosophies. Since Darwinism rejects the fact of creation—and therefore, the existence of God—over the last 140 years it has caused many people to abandon their faith or fall into doubt. It is therefore an imperative service, a very important duty to show everyone that this theory is a deception. Since some readers may have the chance to read only one of our books, we think it appropriate to devote a chapter to summarize this subject.

All the author's books explain faith-related issues in the light of Qur'anic verses, and invite readers to learn God's words and to live by them. All the subjects concerning God's verses are explained so as to leave no doubt or room for questions in the reader's mind. The books' sincere, plain, and fluent style ensure that everyone of every age and from every social group can easily understand them. Thanks to their effective, lucid narrative, they can be read at one sitting. Even those who vigorously reject spirituality are influenced by the facts these books document and cannot refute the truthfulness of their contents.

This and all the other books by the author can be read individually, or discussed in a group. Readers eager to profit from the books will find discussion very useful, letting them relate their reflections and experiences to one another.

In addition, it will be a great service to Islam to contribute to the publication and reading of these books, written solely for the pleasure of God. The author's books are all extremely convincing. For this reason, to communicate true religion to others, one of the most effective methods is encouraging them to read these books.

We hope the reader will look through the reviews of his other books at the back of this book. This rich source material on faith-related issues is very useful, and a pleasure to read.

In these books, unlike some other books, you will not find the author's personal views, explanations based on dubious sources, styles that are unobservant of the respect and reverence due to sacred subjects, nor hopeless, pessimistic arguments that create doubts in the mind and deviations in the heart.

INTRODUCTION

I imagine the operations of a modern international company. Hundreds of thousands of highly qualified people gather under the one roof of this business organization, all working toward a common goal. This company has factories, production facilities, administrative centers, branch offices and subsidiaries throughout the world.

Imagine that the English branch of this company informs the head office in America of the demand trends of consumers in England; the management in America, taking account of the latest consumer expectations, sends a directive to the research and development department in Italy; the prototypes designed in Italy are submitted for public approval back in England. The prototypes that gain approval are produced in the Chinese factories of this international company, and a huge world wide advertising campaign is organized to introduce these new products . . .

The organization outlined above must have highly-ordered communication at every level. Administrators, engineers, workers, advertisers, marketing officials and many others must be in constant cooperation with one another. Success depends directly on communication. Otherwise, this company could not survive in today's rapidly changing and developing environment.

Now, imagine a much larger organization. The number of people that belong to this organization is far greater. Suppose that everyone in the world, about 6 billion people, works for this organization. Everyone has his own special job. Hundreds of thousands, sometimes millions of people gather under the same roof to perform a common task. There is such a tight web of administration and information that every one of these 6 billion people is informed individually by means of a cellular phone as to what he or she has to do. For example, if one of these people is employed in a factory, he may sometimes be told to increase the speed of production, sometimes to slow it down, and sometimes to alter the product. Finally, imagine that an organized plan and communications system exist so that millions of people throughout the hundreds of thousands of different locations all over the world work according to this common plan.

Now, let's enlarge our example a little. Imagine that the population of the world is much greater than it is at present, but that our organization functions even more efficiently.

Suppose that the population is fifteen thousand times greater than it is today, that there are fifteen thousand other planets like this Earth and that the 6 billion people crowded onto each planet make up a total of 100 trillion people. Further suppose that this collection of human beings works together in perfect harmony, each individual being informed by cellular phone as to what he has to do.

This example is beyond our power to conceive, but is actually a simplified description of an existing organization, which operates every second throughout the whole world among the approximately 100 trillion cells that make up the human body.

As you are reading this, millions of operations are happening in your body. In these operations there is a calculation of the needs of every cell in every part of the body, and a determination of what function each cell must perform; measures are taken to respond to the requirements of the cells and each cell is informed individually as to what it must do.

For example, what allows you to read this book are your eye cells, and to nourish them, glucose is required. To respond to those needs, a system was established in your body that calculates how much sugar there is in your blood and that keeps the amount stable. There is a great plan, organized by the web of communication

among the cells, that calculates how many times a minute your heart must beat, the level of calcium stored in your body, the amount of blood your kidneys filter and thousands of other such details. This system of chemical communication that ensures that the 100 trillion cells work in harmony with one another is called the hormone system.

The hormone system, together with the nervous system, ensures the coordination of the cells of the body. If we compare the nervous system to messages sent over the Internet, the hormone system can be compared to a letter sent by post: it is slower, but its effect lasts longer.

When we examine these systems that control the body, a fact becomes clear that most people are not aware of. Most people are convinced that they themselves control the direction of their lives. If you asked someone, "How much of your body do you control?" he would surely say, "All of it." But this answer contradicts the scientific facts.

A person is in control of a very limited part of his body, and even of that part his control is only partial. For example, he can use his body to walk, or to speak or he can use his hands to work, but deep within his body there are thousands of chemical and physical operations going on without his knowing about or willing them. Anyone who thinks that he is completely in charge of his own body (or his own life) is greatly mistaken.

Another fact we will see when we examine the perfect communication system described in this book is this: An organism cannot possibly be formed by lifeless matter, on its own and by chance. Darwinists and materialists do not believe in God; they believe that ultimately living things were formed spontaneously and by chance out of lifeless matter. However, in the twentieth century thousands of discoveries were made concerning cells and the systems contained in them. It is now known that cells have a highly complex design. The communication between hormones and cells alone is enough to show what an extraordinary system exists in cells, and that they could not have been formed by chance.

This book has two aims: First, to show (with the support of scientific evidence) Darwinists and materialists who make chance their god that their philosophy is illogical and untenable. Second, to once again show those who believe in God, examples of the excellence of His creation, so that they may see the glory, power and sublimity of our Lord and exalt Him for His excellent works.

In the pages that follow, we shall examine the hormone system that controls the human body for the benefit of the human being and that is a manifestation of the wonder of creation, and we shall witness together the creative art of God.

THE TWO GOVERNORS OF OUR BODY: THE HYPOTHALAMUS AND THE PITUITARY GLAND

The fact that you are able to sit comfortably in your chair and read these sentences is due to systems that organize the internal balance of your body for your benefit. For example, no matter what the temperature outside, your body must always be kept at a constant temperature, usually between 36.5 and 37.5 degrees. A sudden fall or rise in body temperature may result in death. The body temperature of a healthy individual, thanks to these systems, will vary at most 0.5 of a degree. In the same way, the pressure of the blood in the veins, the amount of fluid in the blood, and the speed at which the cells function must be delicately measured, and the existing balance safeguarded at every moment.

Let us imagine the efforts needed to artificially ensure these balances. First, imagine that there exist delicate thermometers in a few places in the body, special devices to measure the density of the blood in the veins, and mini laboratories to control the rate of speed at which the cells function. Then, imagine that all these thousands of tiny devices located in every point in the body must make the right assessments every second and transmit the information they receive to a highly advanced computer.

However, it is not enough that these assessments are made alone; at the same time, it is also necessary to know, according to the available data, which actions must be taken and what kind of command must be given to which cells.

Of course, even with the state of today's technology, it is still impossible to place thousands of thermometers, a mini laboratory, and pressure measuring devices in the depths of the human body. Yet a special system with the finest possible design has been placed from birth deep in the human body.

Thousands of different receivers measure such things as the body's temperature and the pressure in the blood vessels. Then they send this information to a very special computer. This computer is the area of the brain called the hypothalamus.

Your Body's Hidden Manager: The Hypothalamus

The hypothalamus is the general director of the hormone system; it has the vital task of ensuring the internal stability of the human body. At every moment, the hypothalamus assesses messages coming to it from the brain and the depths of the body. Afterwards, it performs a number of functions, such as maintaining a stable body temperature, controlling blood pressure, ensuring a fluid balance, and even proper sleep patterns.

The hypothalamus is located directly under the brain and is the size of a hazel nut. A considerable amount of information relative to the body state is sent to the hypothalamus. Information is transmitted to it from every point in the body, including the sense centers in the brain. It then analyses the information it has received, decides what measures are to be taken, what changes must be made in the body, and causes the appropriate cells of the body to carry out its decisions.

The basic point that must be noticed here is this: the hypothalamus is an organ composed of unconscious cells. A cell does not know how long a human being needs to sleep; it cannot calculate what the body's

temperature should be. It cannot make the best decision based on the information at hand, and it cannot make another cell in a far removed area of the body carry out this decision. Yet the cells in the hypothalamus act in an extraordinarily conscious manner to ensure that the necessary balances in the body are maintained. In the pages that follow, we shall examine in detail the remarkable activities displayed by these unconscious cells.

One of the most important functions of the hypothalamus is to form a bridge between the hormonal system and the other system that controls and oversees the body—the nervous system. The hypothalamus not only directs the hormonal system, but also the nervous system with a high degree of expertise.

The hypothalamus has a very important assistant in its role of governing the body; this assistant informs the appropriate body areas of the decisions that have been taken. For example, when there is a drop in blood pressure, bits of information are set into motion, and these inform the hypothalamus of the change in pressure; then the hypothalamus decides what measures must be taken to raise it and informs its assistant of its decision.

In order to effect the decision, the helper knows which cells must receive the command. It writes messages in a language that these cells can understand and transmits them immediately. The cells obey the command they have received and take the appropriate action to raise the blood pressure.

This assistant to the hypothalamus is the pituitary gland, which also has a very important influence on the hormonal system.

Between the hypothalamus and the pituitary gland there is a marvelous system of communication. These two pieces of flesh actually communicate like two conscious human beings. The hypothalamus has complete control over the pituitary gland and its vital secretion of several hormones.

For example, the hypothalamus of a growing child sends a message to the pituitary gland with the command, "secrete the growth hormone" and the pituitary gland then secretes the growth hormone exactly as needed.

Something similar happens when the cells of the body need to work faster; this time there is a two-stage chain of command. The hypothalamus sends an order to the pituitary gland which, in turn, sends the order to the thyroid gland. The thyroid gland secretes the proper amount of thyroid hormone and the cells of the body begin to work faster.

When the adrenal glands (which produce several very important hormones) must be activated or the reproductive organs must produce their hormones, the hypothalamus again sends a message to the pituitary gland, which directs it to the relevant areas and ensures the required hormones in those areas are secreted.

The hormones produced by the hypothalamus to direct the pituitary gland include:

Growth hormone-releasing hormone

Thyrotropin-releasing hormone

Corticotropin-releasing hormone

Gonadotropin-releasing hormone.

In some cases the hypothalamus, in order to intervene in the activity of the cells, uses two hormones that it has secreted itself. To store these hormones, it first sends them to the pituitary gland, then, when required, it ensures that they are secreted by the pituitary gland. These hormones are:

Vasopressin (an antidiuretic, i.e., water retaining, hormone)

Oxytocin

These two hormone molecules produced by the hypothalamus are very small. One of them is only three amino acids large. The hypothalamus hormones are distinguished from other hormones not only by being small; they also differ from other hormones by the distance they cover in the body. Hormones generally travel a long distance from the hormonal gland where they were produced to the designated organ. However, the hypothalamus hormones reach the pituitary gland after passing through only a capillary vessel a few millimeters thick. They never enter the general circulatory system.

The hypothalamus produces the hormones that activate the pituitary gland, and when necessary, it also produces hormones that stop the pituitary gland at the appropriate time from secreting a certain hormone. In this way, it has complete control over the activity of the pituitary gland.

The Conductor of the Hormone Orchestra: The Pituitary Gland

The pituitary gland is a small, pink piece of flesh the size of a chickpea, weighing half a gram and connected to the hypothalamus in the brain by a stalk. Thanks to this connection, it takes orders directly from the hypothalamus to produce the required hormones.

This pea-sized pituitary gland has such a great influence on the human body and performs such wonderful functions that it has been the subject of scientific enquiry for years (and still is). This small piece of flesh has won much respect in the scientific world. The pituitary gland has also earned some admiration because of its extraordinary characteristics. For example, the pituitary gland has been called "the conductor of the endocrine (hormone) orchestra." This gland has also been complimented as "the master gland." At the same time, the pituitary gland has been described as an "extraordinary biological wonder."

The pituitary gland deserves these compliments because of the twelve different hormones it produces and the control it exercises over the hormonal system. This gland not only produces hormones that affect particular tissue cells, but also organizes the work of other hormonal glands far distant from it.

If we recall that the hormonal glands are organs that organize the activities of the cells in the body by giving them certain commands, the importance of the pituitary gland becomes all the more apparent. Since the pituitary gland does not stop at giving orders to many cells in the body, it also gives commands to hormonal glands that themselves transmit orders to other cells in the body. In this sense, it functions as a director of directors.

For example, it sends a command to the thyroid gland when conditions require the secretion of the thyroid hormone. In the same way, it issues commands to the adrenal glands, to the testes in the male body, and to the ovaries and the milk glands in the female body.

An important question is:

How do the pituitary gland and the cells which form it know "the function of the adrenal gland," how "it performs its function" and "the sign required to activate it?"

How do the cells that constitute the adrenal gland understand and interpret the command sent to them from the pituitary gland, and why do they obey it?

When we consider the details of the matter, we see that the dimensions of this wonder become even wider. A hormone produced by the pituitary gland is designed to fit on the binding site of the targeted cell. However, no pituitary cell has ever seen the hormonal gland to which a message has been sent. The pituitary cells cannot know the design of the receptors on the cells that compose the adrenal gland. This can be compared to a person who sets out on a journey to a house thousands of kilometers away in another country, who finds himself in front of a door he has never seen, yet has a key that fits the lock at the first try. How do the cells that make up the pituitary gland know how to make the key that fits these locks that they have never seen?

Another important point is that there is no room for error in this system. If the key produced cannot open the targeted door (that is, if the hormone produced does not perform its function in the designated area), death is the result. For example, if the hormone produced by the pituitary gland does not operate on the adrenal gland, the body cannot survive.

In order to understand more fully what a great wonder this system is, we may use the following method: Stand in front of a mirror, place your finger at the point between your two eyes. Five to six centimeters behind this point, right inside your skull, is the piece of flesh, the size of a chickpea, which we call the pituitary gland.

Then, place your other hand on your belly. Just under this hand within the belly area are your kidneys. On top of each kidney there is a gland the size of a walnut weighing about 4-5 grams called the adrenal gland.

These two pieces of flesh can communicate between themselves. They are not two conscious human beings conversing with one another, but two groups of cells. Furthermore, this communication system, together with the effects it produces, is the result of an advanced technology that even human beings do not possess.

The fact that two pieces of flesh deep within our body communicate with and understand one another is a wonder to contemplate.

On the other hand, if a person has not studied biology, he is unaware that such an organ exists in his skull just below his brain. Most laymen do not even know that the pituitary gland is a tiny piece of flesh below the brain which keeps us alive by constantly sending messages and ordering commands to the body. Moreover, this person is totally unaware that all these things are happening. If this gland did not perform its function, this person would die after a short time. If you were to look for a moment from this point of view at the person next to you, you would be able to understand more clearly how helpless and dependent human beings are before God, our Creator.

The Hormones Secreted by the Pituitary Gland

Before going on to consider the names of the pituitary hormones, it is worth repeating that the purpose of this book is to examine those amazing things that happen in the hormonal system that astound even the world of science, and to consider more closely the creative art of God. For this reason, it is better to concentrate on how this system functions, rather than on the names of the hormones. The complex Greek and Latin terms used in medicine and biology are a deterrent for many people. And sometimes these Greek and Latin terms just make the operations of a very simple mechanism more difficult to understand (or to prevent us from appreciating the wonder that occurs in an amazing process). The majority of experts in medicine or biology may not apprehend the wonders that are before them owing to the magic of these words. For example, they know in great detail how the pituitary gland is structured and how it functions, but they never think about the source of the intelligent

consciousness that this tiny piece of flesh demonstrates. For this reason, we repeat that it is not necessary to daunt readers unacquainted with medical literature by devoting space to definitions of these terms. We will only briefly mention the names of the hormones and in the following pages we will examine the great wonders of which they are the vehicles.

The pituitary gland is composed of two parts: the anterior and the posterior glands. Each part secretes different hormones.

The Anterior Pituitary Gland

The anterior pituitary gland secretes six different hormones, whose functions have been determined. Some of these hormones that act on other hormonal glands are called "tropic hormones." They are designed to direct the hormonal system. In the following pages we will examine the functions of the tropic hormones together with the structure and functions of the hormonal glands that they affect. Another group of these hormones stimulate the tissues of the body. The names of these hormones are as follows:

Hormones which stimulate other endocrine (hormone) glands (Tropic Hormones):

1. Thyroid-stimulating hormone (TSH)
2. Adrenal gland stimulating hormone (adrenocorticotrophic hormone – ACTH)
3. Follicle-stimulating hormone (FSH)
4. Luteinizing hormone (LH)

Hormones that act on body tissues (Non-tropic hormones)

5. Growth hormone (GH)
6. Prolactin hormone (PRL)

The Posterior Pituitary Gland

The posterior section of the pituitary gland is the location where the hormones produced by the hypothalamus are stored. Under the right circumstances, these hormones are secreted by a command from the hypothalamus. These hormones are:

1. Vasopressin (antidiuretic hormone)
2. Oxytocin

The Miracle of Growth: The Growth Hormone

A one-year old baby is about twice as heavy and 50% as long as on the day he was born. In one year, he gains weight at an amazing rate. He also grows longer, and his body grows in proportion. What causes a newly born baby who weighs three kilograms and is 50 centimeters long at birth to become a fully grown adult weighing 80 kilograms and measuring 1.80 meters twenty years later?

The answer to this question is hidden in the growth hormone found in an amazing molecule secreted by the pituitary gland.

In order for a baby to become an adult, he must grow. The growing process happens in two different ways. Some cells increase their bulk; other cells divide and multiply. What directs and ensures these two processes is the growth hormone.

The growth hormone is secreted from the pituitary gland and affects all of the cells of the body. Every cell knows the meaning of the message sent to it from the pituitary gland. In compliance with this message, it grows or multiplies.

For example, the heart of a newly born baby is about one-sixteenth the size of an adult heart, yet the total *number* of cells in the baby's heart is the same as that in the adult heart. As the body develops, the growth hormone affects the heart cells individually. Every cell develops according to the command given to it by the growth hormone. As a result, the heart grows and becomes an adult heart.

The multiplication of the nerve cells stops when the baby is six months old and still lives inside the mother's womb. From this time until birth and from birth to adulthood, the *number* of nerve cells remains constant. The growth hormone commands the nerve cells to increase in *size*. When the period of growth of the nervous system has come to an end, it has reached its final form.

Other cells in the body (for example, muscle and bone cells) divide and multiply throughout their period of development. Again, it is the growth hormone that informs the cells how much they must divide.

In the light of these circumstances we must ask this question:

How is it that the pituitary gland knows the correct formula according to which the cells must divide and grow? It is amazing that this piece of flesh, the size of a chickpea, controls all the cells of the body and causes them to grow by dividing or increasing their bulk. Another question that must be asked is: who charged this piece of flesh with this function? Why do these cells throughout their lifetime send messages commanding other cells to divide?

Here again we see the flawless excellence of God's creation. Cells located in one small area ensure the orderly division of trillions of other cells. However, it is impossible for these cells to observe the human body from outside to determine how much the body must grow and at which stage it must stop growing. These unconscious cells, in the darkness of the body, without even knowing what they are doing, produce the growth hormone (and cease producing it) when necessary. A perfect system has been created that controls every stage of growth and secretion of this hormone.

It is another wonder that the growth hormones command some cells to increase in size and others to multiply by cell division because the hormones that reach each kind of cell are identical to each other. How the cell that receives the command must react is written in its genetic code. The growth hormone issues the command to grow; *how* that growth will occur is recorded in the cell. This shows the power and magnificence of creation at every point in the development of the human body.

Yet another very important point is the fact that the growth hormone affects most body cells. If some cells obeyed the growth hormones and others did not, the result would be a disaster. For example, if the heart cells obeyed the commands of the growth hormone but the cells in the rib cage refused to multiply and grow, what would happen? The growing heart would be squeezed in the undersized chest cavity and die.

Or if the bone of the nose grew but the skin on it stopped growing, the bone of the nose would tear the skin and become exposed. The harmonious growth of muscles, bones, skin and other organs is ensured by the obedience of each individual cell to the growth hormone.

The growth hormone also gives the command for the development of cartilage at the ends of the bones.¹ This cartilage is like the unformed shape of a newly born baby; if it does not grow, the baby cannot grow. The cells in this area cause the bone to grow lengthwise but how do they know that the bone must grow in this way? If this bone grew sideways, the leg would not lengthen; it could even rip the skin and be exposed. But everything is planned and this plan is written in the nucleus of every cell.

Another astonishing fact about the growth hormone is *when* it is secreted and *how much*. The growth hormones are secreted in exactly the right amount and at the time when the period of growth is most intense. This is very important because, if the amount of hormone secreted were more or less than what is needed, the result would be quite undesirable. If too little hormone is secreted, dwarfism occurs, and if too much is secreted, gigantism is the result.²

So, for this reason a very special system for regulating the amount of this hormone secreted in the body has been created. The amount of this hormone secreted is determined by the hypothalamus, which is recognized as the director of the pituitary gland. When it is time for the growth hormone to be secreted, it sends the "growth hormone-releasing hormone" (GHRH) to the pituitary gland. And when too much growth hormone has been released into the blood, the hypothalamus sends a message (the somatostatin hormone) to the pituitary gland and slows down the secretion of the growth hormone.³

Yet how do the cells that compose the hypothalamus know how much growth hormone there should be in the blood? How do they measure the amount of growth hormone in the blood and made a decision based on this amount? In order to explain just how great a wonder this is, let us consider an example:

Let us imagine that we have used a special device and reduced a person to several millionths of his original size, that is, to the size of a human cell. We have put him in a special capsule beside one of the cells in the region of the hypothalamus.

The job of this person is to count the number of growth hormone molecules in the capillaries passing in front of him. He determines if there is a reduction or an increase in the number of these molecules. It is well known that there are thousands of different materials contained in the blood. It is impossible for a human being (if he is not an expert in the field) to know from the molecular structure if something in front of him is a growth hormone or something else. But the person we placed in the hypothalamus must recognize with certainty the growth hormones among millions of other molecules. Moreover, he must check the amount of the hormone at all times.

How can the unconscious hypothalamus accomplish this task, which seems very difficult even for a human being? How does it measure at every moment the amount of growth hormone in the blood? How does it distinguish the growth hormone from other molecules? These cells do not have eyes to recognize molecules, or brains to evaluate a situation. But they put into effect the commands given to them in perfect a system that God has created.

The growth hormone is not only secreted in the developmental period but also continues in adulthood. Under these circumstances you would expect that people would continue to grow and become gigantic. But this does not occur.⁴ When a person reaches a particular size, his cells do not continue to divide and grow. Scientists still do not know why this happens. It is known that thanks to a very special system, cells are programmed not to divide and grow any more after a certain time. Given this situation, a person should think about the Power that created this perfect program. This shows us another wonder of God's creation.

It is not very difficult to understand how important it is that trillions of cells stop dividing and growing together at the correct time. If some of these cells did not stop dividing as others did, the result would be terrible. For example, if the eye cells continued to divide and multiply after the other cell groups have ceased to do so, the eye would be squeezed in its socket and burst.

After speaking about trillions of cells suddenly stopping their activities, there is something else worth remembering. Cancer is a disease that we have been fighting for decades and still have not conquered; it is caused by one single cell continuing to divide out of control. This example permits us to better understand the delicate balance that exists in the body.

In adulthood, the growth hormone continues to have an influence on a few special cells and stimulates these cells to divide and multiply. This is another wonder of creation that serves a special purpose. This cell division no longer causes the body to grow, but serves to repair and regenerate the body. For example, skin cells and red blood cells continue to divide causing our bodies to gain 200 million new cells every minute.⁵ These cells replace old and damaged cells. By this means, the total number of cells remains constant.

The growth hormone has a special design by which it brings several factors into use to ensure cell division and growth.

For cell division and growth to occur, it is first necessary that the cells increase in size, which is possible only through an increase in their amount of protein. So, the growth hormone has a special function in accelerating the production of protein in the cell.

It is known that protein production occurs as the result of a complex process. Scientists have been able to understand only some of the superficial elements in this process after long years of research. In order to produce one molecule to accelerate the operation of this system, it is necessary to know all aspects of it. The fact that the growth hormone has a design that enables it to speed up the production of protein is a proof that the system that produces protein and the growth hormone are created by God to act in harmony with each other and perform their functions according to His command.

The growth hormone not only ensures the acceleration of the synthesis of protein, but also ensures that the requisite amount of raw material enters the cells for this purpose. The main material needed for the synthesis of protein is amino acids, the building blocks of protein. As if they were aware of this information, the growth hormone stimulates the cell membrane so that it can receive more amino acids.

In order to speed up the synthesis of protein, the metabolism of the cell must also be accelerated and, to this end, the growth hormone cooperates with other hormones. The thyroid hormone secreted during the period of growth accelerates the metabolic activities of the cells.

In order for all this to happen, one more very important thing is needed: energy. Even if all the systems we have mentioned so far were perfect, they would be of no use without a source of energy. Without energy, the growth process could not occur. But the human body has been so perfectly planned that this need too has been provided for. In addition to all these intricate functions, the growth hormone performs one more very important

duty. It ensures the release of fat molecules to mix with the blood. In this way, each molecule will serve as a source of fuel fulfilling the cell's energy needs.

When reading about the activities of the growth hormone in the body, it is important to recall that what accomplishes this is a lifeless, unconscious molecule formed by the combination of a few atoms that have no hands, eyes, or brain. It is remarkable that a lifeless bit of matter can know when and where to go in the body, and when, how and by what means to stimulate it. Unconscious atoms cannot write messages and send them to one another, but this wonderful event happens when some molecules interact with each other. They immediately know what they must do and then do it. For example, when some molecules interact with the growth hormone, they immediately begin to divide. Others decide to take more amino acids. And for this it is only necessary to respond to the growth hormone. How can such a conscious and organized activity continue without interruption in the body?

To claim that all these wonderful balances came to be in the course of time by the operation of chance flies in the face of scientific fact and logic. This is because only one deficiency could destroy the whole system. In order for a living thing to survive, its whole system and all its organs must come to be at the same time. Everything reviewed so far about the growth hormone and these delicate interrelated balances demonstrates the fact that human beings were created perfectly as a complete organism. Concerning the excellence of creation, God says in the Qur'an:

He is God—the Creator, the Maker, the Giver of Form. To Him belong the Most Beautiful Names. Everything in the heavens and Earth glorifies Him. He is the Almighty, the All-Wise. (Qur'an, 59: 24)

The Prolactin Hormone

This hormone secreted by the pituitary gland stimulates the milk glands in a woman's breast causing the production of mother's milk. This production is under the control of the hypothalamus. How this hormone performs this function will be explained in detail in the section "The wonder of Mother's Milk."

The Oxytocin Hormone

This hormone is produced by the hypothalamus and stored in the posterior pituitary gland. It is secreted when necessary by the pituitary gland on receiving a neural stimulation from the hypothalamus. Its functions include contracting the milk channels. Other functions of the oxytocin hormone in the production of mother's milk is treated in detail in the section "The Wonder of Mother's Milk."

In addition to its function in the production of mother's milk, the oxytocin hormone has another duty. It ensures the contraction of the muscles of the uterus at the time of birth to facilitate the birth process. During labor, the production of oxytocin quickly increases. At the same time, the uterine muscle develops a remarkable sensitivity to the oxytocin hormone.⁶ During the birth process, some women are given an injection of oxytocin to help relieve the pain and to speed the birth process.

In order for the production of oxytocin to occur normally, the cells which make up the hypothalamus must be aware of all the elements involved in the birth process that happen a great distance from them. They must know that birth is a difficult process and that they must contract the uterine muscles to push the baby out. Moreover, they must know that a chemical production is necessary for the contraction of the uterine muscles to occur, and they must know the correct formula.

The One Who places the production plan of the oxytocin hormone in the genes of the hypothalamus cells, Who creates the new baby about to come into the world, the mother, the mother's womb, and the hypothalamus cells is God.

The fact that God is the Sovereign of everything that happens in heaven and on Earth, and that everything comes to pass under His supervision is revealed in the Qur'an:

Everyone in the heavens and Earth belongs to Him. All are submissive to Him. It is He Who originated creation and then regenerates it. That is very easy for Him. His is the most exalted designation in the heavens and the Earth. He is the Almighty, the All-Wise. (Qur'an, 30: 26-27)

The Wonder of Mother's Milk: The Prolactin and Oxytocin Hormones at Work

The nutritional needs of a newly born baby are very different from those of an adult. Because a baby's immune system is weak compared to that of an adult, it is necessary to give it support from outside. The ideal nutrient to respond to all the new baby's needs is mother's milk. Research has shown that breast-fed children are much more healthy and their bodies are better developed.⁷

Another wonder of mother's milk is that it changes its composition according to the changing needs of the baby at each stage of its development. The huge baby food producers have spent millions of dollars on research trying to determine the ideal mixture of ingredients for a baby's healthy development. So far, they have not found a perfect mixture, but they have determined that a special mixture is needed to meet the requirements of the baby at each stage of its development. In laboratories equipped with the most advanced technology, attempts have been made to produce artificial baby food similar to mother's milk, but no artificial nutrient has yet been developed to take its place.

Here is a real wonder. A few cells in the mother's breast calculate all the needs of a newborn baby in the outside world; that is, the needs of a being they have never before seen or encountered. Then they produce what scientists have never succeeded in producing in the laboratory— mother's milk with its perfect mixture of nutrients. However, the cells that make up the milk glands in the mother's breast are, like other cells, unconscious, without intelligence; yet it is possible for them to calculate the formula needed to produce it.

How does the production of mother's milk begin and how is it controlled? A number of wonders of creation are hidden in the answer to this question. In the production of milk, the hormonal system and the nervous system work in concert and the production occurs after planning based on an exchange of information.

The hormone that activates the milk glands in the mother's breast, as noted, is the prolactin hormone secreted by the pituitary gland. In the early days of pregnancy, certain factors suppress the secretion of prolactin.

These factors are like a foot pressing on the brake of an automobile going down a hill. The automobile tends to go downhill, but when the brake is applied, it cannot move. The production of milk is hindered in the mother.

The hindering of prolactin production is very important because, while the baby is still unborn, the milk production in the mother is not needed. How is this brake applied, and how is premature secretion prevented? Here is a true wonder of design. The hypothalamus in the brain secretes a hormone that prevents the production of prolactin. This hormone, called PIH (Prolactin Inhibiting Hormone), slows down the production of prolactin or, in other words, applies the brake.

Who decides to apply the brake? Estrogen, a hormone produced during pregnancy, ensures that the brake is applied by producing PIH. When the baby is born, the amount of estrogen secreted is reduced, which also reduces the amount of PIH. This is like the foot slowly releasing the brake and the car moving down the hill. In this way, the production of prolactin slowly begins and activates the milk glands to produce mother's milk.

Here we see a real wonder of creation. Thanks to this design, the production of milk is prevented during the first months of pregnancy. Consider this whole system carefully:

1. Where do the cells of the pituitary gland that produce prolactin know the milk glands from? With what conscious intelligence do they give the command to the milk producing cells to produce milk?
2. How do the hormones that prevent the production of prolactin before birth know that the time for milk production has not quite come?
3. How do these hormones learn that prolactin causes the production of milk and that, to prevent the production of milk, the production of prolactin must be inhibited?

Yet another system stimulates the production of mother's milk at the right time; this system is another proof that shows how deliberately the human body is created.

When the baby sucks the milk, nerve cells in the mother's breast send a nerve impulse to the hypothalamus. This impulse affects the hypothalamus and ensures that it removes the brake from the prolactin. In this way, the production of prolactin increases and the milk glands are stimulated for milk production.

From the time of birth, specific receptors are designed in the mother's breast that recognize the baby's sucking reflex. These sensory receptors are connected via neural pathways—similar to electric cables in a building—to another distant organ, the hypothalamus area of the brain. That is, a special system has been created to inform the hypothalamus that the baby's sucking reflex has begun. From among the countless possibilities within the human body composed of flesh and bones, these neural signals travel to the right location. They are not connected by accident to the brain's vision center, the stomach or the intestines; they are connected to exactly the right place, that is, to the hypothalamus.

When this electric signal reaches the hypothalamus cells, they begin the necessary operation for the production of mother's milk. But these cells have no intelligence or consciousness of their own. They cannot possibly *know* that this signal has come from the mother's breast or that they have been informed of the baby's sucking reflex and, therefore, that mother's milk must be secreted; they cannot *know* that an important function has been assigned to them in the production of mother's milk, or that they must increase the production of prolactin to activate the milk glands. This being the case, what causes these unconscious cells to engage in this conscious activity?

Who has placed the receptors in the mother's breast?

Who provided the cables to carry the signals sent by these receptors?

Who attached the ends of these cables to the hypothalamus?

Who taught the cells of the hypothalamus that they must stimulate the pituitary gland when these signals come?

Who wrote the formula for activating the milk glands in the cells that make up the pituitary gland?

Who created the circulatory system to ensure that this hormone reaches the mother's breast from the pituitary gland in the brain?

Who created the breast cells in such a way as to become activated when this hormone comes?

Who taught the breast cells the unique formula of mother's milk, a formula which even yet scientists cannot reproduce?

To all these questions there is only one answer: Almighty God, the Lord of all the worlds.

Thanks to scientific and technical advances, it is possible for humans to examine the human body more carefully. This possibility shows the degree of intelligence and planning with which the systems in the human body were created and reveals the creative artistry of God.

For those who reject the existence of God, there is, as always, only one delusion in which they can take refuge—time and chance.

These people accept only chance and the outworking of natural law as the origins of the plan and artistry displayed in living things and in the universe as a whole. But what we have explained above in superficial detail about mother's milk is enough to show the meaninglessness of this claim.

It is scientifically impossible that any one of the thousands of different elements in this system, for example, the breast, the pituitary gland, a nerve or a cell of the hypothalamus or even a single hormone could have come to be by evolution. It is necessary that *each* element of this system, together with the ancillary systems needed to ensure survival (for example, the circulatory and respiratory systems), come into existence suddenly and at the right location where they are needed to perform their specific functions. Only one explanation exists for this: this system is created by God.

Another proof of creation in the wonder of mother's milk is the oxytocin hormone.

Above we have described the perfect design that exists for the production of mother's milk. But there is a problem: the production of the milk in the milk glands is not sufficient. With his strength alone, the baby cannot suck the milk from the nipple as easily as from a feeding bottle; the milk must travel from the milk glands to the nipple. Otherwise, the system we have described so far will be useless; the mother's milk will not be able to reach nipple from the milk glands and the newborn baby will not receive any nourishment. So, how is the milk made to reach the nipple and the baby?

The countless numbers of people throughout history who have been fed on mother's milk—ourselves included—owe a debt to the oxytocin hormone.

This hormone ensures the contraction of the muscles surrounding the milk channels, moves the milk from the milk glands toward the nipple where it is easily accessible to the baby at breast-feeding time.

Very well. How do the cells that produce the oxytocin hormone know that the milk must reach the mother nipple before it can be used, and that otherwise the baby would not be able to feed? And even if they knew this, how could they know the proper means needed to cause the cells in the milk channels contract?

These are the questions that must be asked by anyone who wants to gain a better understanding of the excellence of this system. The conscious intelligence that is manifested in every cell in the human body bears witness to the eternal knowledge of God Who created them from nothing. In the Qur'an, God reveals that He Himself has ordered everything in heaven and on Earth.

He directs the whole affair from heaven to Earth... (Qur'an, 32: 5)

The System That Regulates the Amount of Fluid in the Blood: The Antidiuretic Hormone

Do you know how much fluid there must be in your body to be healthy? Can you calculate how many grams of fluid you take in from the food you eat and the liquids you drink every day? Or can you determine how much of this fluid you must discharge from your body in the same period of time? Can you figure out how many grams of fluid there are in your blood every second of the day, or the level of fluid in your body tissues, or your blood pressure?

If the duty of calculating these numbers were given to each human being, he would be required to devote all his time to this job. This is very important because the human body must be prevented from losing too much fluid. If the fluid loss reached around ten per cent of the body's normal fluid level, death would result.

But a person does not need to measure the amount of fluid in his own body because his body has a system that regulates and orders the fluid level. If you were to examine the details of this system, you would encounter a surprising wonder of engineering and planning.

Loss of body fluid results from sweating or not drinking enough water. If there were no special system in our bodies, no matter how low the density of blood fluids might fall, you would not know it and would eventually die. How is the decrease in the amount of blood fluid sensed and with what measures is it corrected?

There are special sensors in the hypothalamus area of the brain called osmoreceptors. These sensors measure the amount of fluid in your blood at every moment you are alive. If they determine that the amount of fluid in the blood has fallen, they immediately react.

If we substitute a human being in the place of one of these receptors in the hypothalamus, this person would have to measure the amount of fluid in the blood for 24 hours without tiring and without sleeping for all his life. Of course, it is impossible for a human being to carry out such a duty, yet a group of cells devotes its whole life to calculating the amount of fluid in the blood. This shows that this group of cells is performing a function that has been given to it. The hypothalamus does its job under the inspiration of God.

Let us assume that the amount of water in blood has dropped. Under this circumstance, what would a human being who was put in the place of these receptor cells have to do? If it were impossible to take a drink of water, how would you raise the amount of fluid in the blood?

If you had no training in biology, it may not enter your mind to purify the water molecules in the urine and send them back to the blood. Even if such an idea came to your mind, you would not know how to achieve this.

At the moment the sensor cells in the hypothalamus detect a fall in the fluid level of the blood, they react with great ingenuity. They make use of a very special messenger hormone (the antidiuretic hormone, ADH) reserved in the pituitary gland. This message is written for the cells surrounding the millions of microscopic tubules in the kidneys. A message is sent to these cells, ordering them to keep back the water molecules in the urine.

At this point, several questions come to mind: How do cells located in the pituitary gland have the intelligence to send orders to kidney cells far distant from themselves and which they have never seen before? How can they write a message that the kidney cells will understand and obey?

Thanks to this communication system, they purify a great number of water molecules in the urine and mix them with the blood again. As a result, the amount of urine is reduced and fluid in the body is restored to a certain level.

In the case that we have drunk too much water, the reverse operation is put into effect. When the fluid level of the blood increases, the sensors in the hypothalamus slow down the release of the ADH hormone. When this happens, the absorption of fluid in the kidneys is decreased. The amount of urine increases and fluid level in the blood is held in balance.

A characteristic of the ADH hormone is its ability to contract the blood vessels to cause an increase in blood pressure. This is a very well designed security assurance system and another proof of the fact that human beings are specially created. In order for such a security system to function, a comprehensive plan has been put into effect. In the upper chambers of the heart and in the veins coming into the heart, special devices have been placed to measure the pressure of the blood. The cables (nerves) coming from these devices are connected to the pituitary gland. When blood pressure is normal, these devices are stimulated and continuously send electrical impulses to the pituitary gland to prevent the release of the ADH hormone.⁸

This system resembles an alarm system that uses infrared rays. If a thief unknowingly comes into contact with one of these rays, the connection between a source of light and a receiver is broken and an alarm sounds.

As in this example, when the pituitary receives a signal from the receptors in the heart and veins, it means that all is well.

In the case of heavy bleeding, a person loses a lot of blood, and the amount of blood in the veins decreases. As a result, the blood pressure falls, a very dangerous condition.

When blood pressures falls, the signal sent to the pituitary gland from the receptors in the heart and the veins is broken, causing the pituitary gland to go into a state of alarm and secrete the ADH hormone. The ADH hormone immediately causes the muscles around the veins to contract, thus raising the blood pressure. In order to understand this very complex, interrelated and multifaceted system, a few details are necessary.

1. How do the hypothalamus cells, which produce the ADH hormone, know the structure of the cells that surround the veins, cells that are located at a great distance from them?
2. How do they know that these muscles must contract in order for blood pressure to increase?
3. How is it that these cells can produce the chemical formula to bring about this contraction?
4. Where did the neural "transmission cables" of this communication network between the heart and the pituitary gland to produce such a perfect alarm system come from?

Certainly, we have here a real design which shows that human beings did not come into being by the unconscious operation involving chance, but as the result of a perfect act of creation. The evolutionists' claim that the body's communication and alarm system is the result of chance and necessity, that the cells themselves contrived, designed, and constructed this system is contrary to reason. Such a claim is like asserting that a pile of cement, bricks and electrical cable were unloaded on a plot of land and three storms happened: as a result of the first, these building materials formed a skyscraper; after the second, they furnished the skyscraper with an electrical system; and after the third, they put a perfect security system in the building. No one with common sense would accept such an illogical claim. But the evolutionists make even more illogical assertions.

Evolutionists, who dogmatically insist on not accepting the existence of God, defend the theory of evolution without considering how contrary to reason their denials are.

However, it is very evident that God exists and that He has created everything in the heavens and on the Earth according to a perfect design:

... Everything in the heavens and Earth belongs to Him. Everything is obedient to Him, the Originator of the heavens and Earth. When He decides on something, He just says to it, "Be!" and it is. (Qur'an, 2: 116-117)

Hormones That Are Able to Regulate Time and Produce the Differences Between the Sexes

We all have a biological clock within us—this expresses the idea that there are a number of micro-clocks in various regions of our bodies programmed to regulate time. One of these micro-clocks is located in the hypothalamus area of the brain.⁹

Human beings go through a period of adolescence between childhood and adulthood when the body experiences many definite changes. Girls enter adolescence between the ages of eight and fourteen, boys between the ages of ten and sixteen.

This clock that never goes wrong has been placed in the bodies of the countless human beings that have been created until today. How can this clock understand without error that a person has come into adolescence?

One hypothalamus area of the brain has been waiting for years since the time of birth to perform its very special function. At just the right time, that is, when the time to pass from childhood to adolescence has come, an alarm clock goes off in the hypothalamus. This indicates that the hypothalamus must begin a new job.

Actually, scientists use the comparison to a clock to describe this process in a more understandable way. Of course, there is no clock in the hypothalamus, but comparing it to a clock is the best way to describe how cells wait for years to go into action at just the right time.

How do the cells that make up the hypothalamus know that the right time has come? The scientific world has not yet been able to explain how a small piece of flesh can act in such a conscious and programmed way.¹⁰ It is likely that the details of this system will be understood as years go on, and when they are understood, they will provide another proof of the perfection of God's creation.

With the sounding of the alarm, the hypothalamus secretes the special GnRH hormone. This hormone sends a command to the pituitary gland to secrete two hormones, the Follicle Stimulating Hormone (FSH) and the Luteinizing Hormone (LH).

These two hormones have very special functions and marvelous abilities. Each one begins the process of physical differentiation and development of the male and female body. The FSH and the LH hormones have been designed to effect the areas in which this change will occur and they act as if they knew very well what they have to do.

In the female body, the FSH hormone causes the maturation and development of eggs in the ovaries and ensures the secretion of the very important estrogen hormones by this area.

The FSH hormone is secreted according to the same formula in the male body, but here it has totally different effects; it stimulates the cells in the testes and initiates the production of sperm.

In the female body, the LH hormone ensures that the maturing egg is released and that another hormone called progesterone is secreted.

LH performs a different function in the male body. It stimulates a special group of cells in the testes called the leydig cells and ensures the secretion of testosterone.

It is very interesting to think that these hormones are produced according to the same formula in the bodies of each of the sexes and that in each case the effects are totally different. How do the hormones know the difference between the male and the female body? How does it happen that a hormone composed according to one formula causes the production of testosterone in the male and progesterone in the female? How can hormones of the same formula recognize the male body on the one hand, and ensure the development of the male voice and musculature, and, on the other hand, how can they know the chemistry and special qualities of the female body and make the changes accordingly? Who placed this wonderful genetic program in the cells according to which one hormone has different effects and causes the development of the different sexes?

Who has the intelligence to formulate a plan such as this? Do chance events have such intelligence? Do unconscious cells have it? Or do the atoms that form the cells have it?

It is completely evident that this intelligence does not belong to chance events, to the cell or to the atoms which compose cells. These developments are regulated with a view to the particularities of males and females and show us the existence of a deliberate design and plan. This plan and supreme intelligence belong to God.

THE RHYTHM OF LIFE: THE THYROID GLAND

Today in factories and modern industrial plants, the most important thing on the agenda is "productivity." Every department of a factory must work with ideal speed but it is not enough that the individual units work to the ideal speed by themselves. Every unit must work in harmony with the others. If one unit thinks that there is an advantage in working on its own faster than the others, this could cause harm rather than benefit. For this reason, industrial engineers and strategic planners work in factories and plants to put planning into place and ensure productivity.

Imagine a factory that produces millions of different products, operates twenty-four hours a day without a break, and has 100 trillion workers. No doubt, an army of engineers and business planners would be required in this factory to formulate a productivity plan and determine how quickly each group of workers will work must productively.

In real life there exists such a factory, but engineers and business administrators do not work in it. The work is done by a small set of cells and the hormones that they secrete.

This factory is, of course, the human body and what is responsible for the productivity of this factory is the thyroid gland. With the help of the thyroxine hormone secreted by the thyroid gland, 100 trillion cells are individually organized to function according to a certain rhythm and at a certain rate of speed. This hormone determines how quickly nutrients are converted into energy and how efficiently food burns in the body.

For example, most young people, especially those still in the process of growth, have a very high rate of metabolism, and the food they consume is quickly turned into energy. In other words, the nutrients they eat are quickly burned so that they do not gain weight easily. Generally, as people grow older, there is no difference in their appetite but, if they eat the same amount of food as when they were younger, they gain weight. The reason for this is that, when they were younger, the body cells produce energy from their food at a higher rate. When a person gets older, the energy produced by the cells from the burning of nutrients is lower and unburned food is stored in the body as fat.

If you were a factory owner, you would work to ensure that your employees worked in the most productive manner and, at the same time, you would make sure that they paid attention to their own health and safety. If the employees in one department of your factory worked more slowly than they should, it would not be good for the factory's general production. If there is no foreman to tell the workers what job they must do and how quickly they must do it, production will suffer.

The same thing happens in our bodies. If there were no foreman to tell your cells how quickly they must work, the result would cause the activity of the cells to slow down, the food you ate would turn to fat, you would not have enough energy to raise your arm, and your whole body would come to the point of exhaustion. When too little thyroxine hormone is secreted, a condition called hypothyroidism occurs which is characterized by these symptoms.¹¹

But even if you are not aware of it, your thyroid gland is working for you, secreting the thyroxine hormone that controls each one of the 100 trillion cells and prevents them from slowing down. As a result, you can live your daily life normally.

Thyroxine not only prevents the cells from moving too slowly, it also prevents them from working too fast. Because this hormone is secreted in a definite amount, the speed at which the cells work is kept in balance. If the cells of the body worked more quickly than they should, "toxic goiter" would develop, caused by the excessive secretion of thyroxine.¹² Symptoms of this disease include the increase of the metabolic rate, a rise in body temperature and blood pressure, weight loss, excessive sweating and general nervousness. The eyes bulge in their sockets and, in advanced stages of this disease, blindness and even death (due to cardiac insufficiency) can result.

The tissues that make up the human body are continually being renewed. Every day approximately 200 grams of muscle and tissue cells are renewed.¹³ Every minute 200 million cells in our bodies are produced to replace dead cells,¹⁴ and it is the thyroxine hormone that determines the speed at which this renewal takes place.

How does this hormone-producing thyroid gland know the speed at which the cells in our bodies must function? How does it determine the speed of the replacement of body cells? The person himself does not even know the speed at which his body's cells have to function, and most people are not even aware that their body cells have a particular speed at which they must function. If someone wanted to interfere with the speed at which his body cells work, he could certainly not affect the cells with his own will. In order to do this, he would have to obtain medical help or take some medication. Human beings do not determine the speed at which their own cells work; this is under the control of that small piece of flesh called the thyroid gland.

How has the thyroid gland determined the ideal working speed for the cells? How does it know the working speed of the hundreds of different systems contained in the cells—systems that scientists are still investigating? Let scientists continue to try to understand these systems; the thyroid hormone knows all the details of these systems, including what kind of intervention is needed to increase their working speed. To do this, it produces a specific molecule type and sends them to each of the cells one by one. In light of this, we must accept that the cells, which make up the thyroid gland and produce thyroxine, have a much higher intelligence about this process than human beings.

Remember, like all the cells in the body, cells that compose the thyroid gland do not have any conscious intelligence.

As can be seen in the picture on the left, a thyroid molecule is composed of lifeless, unconscious atoms. The cells perform their function according to humanly inconceivable genetic program written in their nuclei. This fact brings to light even more the enormity of the miracle of creation.

It is God, the possessor of eternal intelligence and knowledge, Who wonderfully created the cells of the body, the genetic program that determines the functioning of this system, and the inner systems of the cells that translate and interpret this genetic program.

Moreover, in the genetic programs of the cells that compose the thyroid gland, He wrote the molecular formula of the hormone that accelerates the activity of other cells. So it is evident that a remarkably harmonious system has been put in place which proves once more the perfection of God's creation. In the Qur'an, God reveals harmony and perfection that is seen everywhere in the world:

He Who created the seven heavens in layers. You will not find any flaw in the creation of the All-Merciful. Look again – do you see any gaps? Then look again and again. Your sight will return to you dazzled and exhausted! (Qur'an, 67: 3-4)

The Proportion in Our Bodies

Thyroxine has another wonderful characteristic in that it works in cooperation with the growth hormone. These two molecules act together in harmony toward a common goal. There is only one explanation for this: these two molecules were created for this common task.

You will recall from earlier pages that the growth hormone is the molecule that orders the cells of a developing child to grow and multiply. This hormone stimulates the cells to grow in both size and number. But there is another very important detail that must be planned—the speed of cell division. Thyroxine influences the speed of cell division during the period of growth, ensuring complete development of the body.

To understand the importance of thyroxine, we just have to look in a mirror. So long as there is no birth defect, every individual's mouth, nose, eyes, the face—in short, everyone's whole body—has a proportion that resembles that of almost everyone else. The body has this proportion due to the perfect functioning of the thyroxine hormone that God created. If you were reading these sentences years ago as a young person in your developing years, and the thyroxine molecules did not go to each one of your individual cells and inform them of the speed at which they must divide, your body's organs would have developed without proportion. You could even have become mentally impaired, as is the case when cretinism occurs as the result of insufficient secretion of thyroxine immediately after birth. The bodies of people afflicted with this condition lack proper proportions when grown; generally they have very short legs and a large skull. In addition, a lack of thyroxine also causes dwarfism.¹⁵

Most of the people you see in your daily life (your schoolmates, fellow workers, people in the street, and your family) have bodies perfectly shaped by God's creation by means of the activity of two small molecules—growth hormone and thyroxine. These hormones are secreted at the right time and in the right amount, commanding trillions of individual cells with orders as to how much and how fast they have to multiply. As a result, a perfectly formed human body comes into being.

In the majority of human beings, the amount of this molecule is adjusted in a very special way so that neither too much nor too little is produced. If the amount of these hormones produced varied too much from one individual to another, there would be major physical differences between people; millions of people would be between 2.5 and 3 meters tall; millions would be one meter or less in height, everyone would have a body and facial structure lacking proportion, and almost everyone would be mentally retarded. Millions of people would die while still in adolescence.

To repeat: the external appearance and physical characteristics of human beings is due to two small molecules that God has wonderfully created—the growth hormone and thyroxine. This is another proof of how God has constructed human beings on a foundation of delicate balances:

He created the heavens and the Earth with truth and formed you, giving you the best of forms. And He is your final destination. (Qur'an, 64: 3)

One Hundred Trillion Micro-Heaters

In order for you to be able to read this page, your body temperature must be at a certain level. If this temperature falls or rises too much, you will die. For this reason, some systems that keep the body temperature at a definite level have been created and placed within the human body. One of these remarkable systems is the thyroxine hormone. The body reaches a certain temperature as the result of the activities of its 100 trillion cells. We can compare these cells to micro-heaters, and the wonderful molecule that controls how much heat each micro-heater must produce is the thyroxine hormone.

It is in itself a wonder that cells produce a certain amount of heat as they do their work and that the total amount of heat produced by the 100 trillion cells is exactly the amount that is required for human beings to survive. Moreover, the thyroxine molecules know how much heat the cells must produce. Together with all of this, the fact that the cells know how they can act on the metabolism and raise the body's temperature is one more wonder of creation.

A Delicate Control Mechanism

A highly advanced and organized system has been created to regulate the amount of thyroxine secreted. The secretion of thyroxine occurs again as a result of a chain of command of a set of unconscious cells organized in a highly disciplined hierarchy.

When thyroxine is needed, the brain of the hormonal system—the hypothalamus—sends a command (the TRH—Thyroid-releasing Hormone) to the conductor of the hormonal system orchestra (the pituitary gland). When it receives the command, the pituitary gland understands that the thyroid gland must be activated and immediately sends a command (the TSH—Thyroid Stimulating Hormone) to the thyroid gland. The thyroid gland, as the last point in this chain of command, immediately secretes thyroxine in compliance and distributes it throughout the whole body by way of the blood.

How is the amount of this hormone that needs to be secreted determined? How is it that, except in cases of illness, neither more nor less of this hormone than is needed is secreted?

The amount of thyroxine secreted is determined by a special system created by the great artistry of God. This system is based on two separate, negative feedback mechanisms and is an example of an incomparable wonder of engineering design.

When the amount of thyroxine in the blood rises above normal, the thyroxine hormone produces a very interesting effect on the pituitary gland and sometimes directly on the hypothalamus: it reduces the sensitivity of the pituitary gland to the TRH hormone.

The function of the TRH hormone is to activate the pituitary gland to send a command (the TSH hormone) to the thyroid gland. This command is the second point on the chain of command in the production of the thyroxine hormone.

The system is so intricately designed that the excess thyroxine takes highly intelligent measures so that the sources in which it is itself produced do not make too much, and it interferes with and severs the chain of command established for its own production. By this means, when the thyroxine in the blood rises above normal, the production of thyroxine is automatically curtailed.

We can understand this more easily with some examples: imagine that small intelligent machines were made in a factory. These machines were made in three stages:

1. First stage: computer A sends a production command to computer B.
2. Second stage: computer B translates this command into another language and sends it to computer C.
3. Third stage: computer C begins to produce the desired machines with the help of a robot.

Suddenly, production exceeds what is required and there are more machines in stock than are needed. At this stage, one section of the machines in stock goes to computer B and removes the cable connecting computer B with computer A. Now, computer B cannot receive a command from computer A. Since the production command cannot reach computer C, production ceases and the computers in stock last until the supply runs out. When the stock runs low, the cable connecting computer A with computer B is again attached by the machines and production resumes.

If such machines were made which could supervise their own production and that of the machines that produce them so intelligently, a revolution in industry and technology would be the result. In every human being, there exists such a fantastic system of production occurring every minute.

A second system also determines the amount of thyroxine produced. An increase in the amount of thyroxine affects the cells in the hypothalamus. These cells reduce the production of TRH and, therefore, the amount of TSH secreted in the pituitary gland is reduced. By this way, the production of thyroxine is slowed down.

Using the above factory example, it is useful to examine this second system. The effect of the thyroxine on the hypothalamus and its curtailment of the production of TSH can be compared to the machines produced in our imaginary factory that slow down the information flow from that computer. Not only the communication between computer A and computer B is cut, but computer A is also slowed down, thus being prevented from sending a command to computer B.

When the amount of thyroxine in the blood is reduced, the system works in the reverse direction. More commands are sent from computer A and the capacity of computer B to receive these commands is increased. As a result, the hypothalamus secretes more TRH hormone, the pituitary gland becomes more sensitive to TRH, and raises the production of the TSH hormone. In this way, more thyroxine is produced and secreted.¹⁶

How does the thyroxine hormone know that the chain of command must be broken in order to stop its production? How do the cells in the hypothalamus know that, when the level of thyroxine is high, its secretion must be stopped and, when it is low, its secretion must be increased? How did this flawless system come into being?

To think that this intricately planned system came to be by time, chance, and natural law is more outside the realm of sound thinking than to think that a computer or a television could come into being by a similar process. In order for this system to be able to function, hundreds of specially designed molecular sized structures (which we have not described in detail) are required. It is a clear fact that this system was created by a supreme intelligence, that is, by God.

Four Out of Ten Thousand Molecules

The amount of thyroxine secreted is determined by the amazing system we have described above. But together with all this, there is another remarkable system that keeps the level of thyroxine in the blood stable in times of crisis.

Thyroxine molecules are secreted by the thyroid gland into the blood and must soon become attached to molecules specially designed to transport them in the blood. While they are attached to this molecule, they cannot perform their function. Of the thousands of thyroxine molecules, only a few freely circulate in the blood. It is only about four out of ten thousand thyroxine molecules that affect the metabolic speed of the cells.¹⁷

After the free thyroxine molecules enter the target cells, other thyroxine molecules that detach from their carrier molecules take their place. The carrier molecules serve as a storage reservoir to ensure that enough thyroxine is ready when needed.

We have already seen how delicately the balance of the amount of thyroxine required to affect the cells is adjusted and the medical problems that can result if the amount of thyroxine rises or falls. This delicate balance involves a proportion of four free to ten thousand bound thyroxine molecules. In the light of this, these questions must be asked:

Who counted these trillions of molecules and decided that only close to four out of ten thousand are needed for the health of human beings? Who calculated that nine thousand nine hundred ninety-six molecules out of every ten thousand molecules must stand by idly? Who foresees that there will be a reduction of the number of these four molecules out of every ten thousand molecules roaming in the veins, and releases more molecules? Who made this incredible mathematical calculation and created this system that has existed in every human ever born?

Certainly this example is a proof that God is sovereign over everything both visible and invisible, that He encompasses and determines most exactly the number of all things on the face of the Earth.

So that He may know that they have indeed transmitted the Messages of their Lord. He encompasses what is in their hands and has counted the exact number of everything. (Qur'an, 72: 28)

THE SENSITIVE CALCIUM-METERS

The amount of calcium in the blood is a very important factor in human survival. In order for a human to survive, he needs to not only breathe and drink water, but he must also have a certain amount of calcium in his blood. If the level of calcium in the blood falls below what is required, death will result. Now, let us think of this hypothetical example: A container in front of you contains one liter of blood. This blood is to be transfused into a patient waiting for an operation. It has been discovered that there is a deficiency of calcium in this blood, but the amount of the deficiency has not been determined. You are asked to make a guess and supply the deficiency. You have been given a large container of powdered calcium to use.

How would you make this decision?

First, you would have to measure the amount of calcium in the blood in front of you. But you would need such advanced technological tools that you would have neither the time nor the opportunity to do it. In this situation, you would be completely helpless. The fact that you are unable to measure the amount of calcium in the blood in front of you may result in the patient's death.

Let us change our example slightly: Now you are given one liter of blood which contains no calcium, and you have to add the right amount of it. How many spoonfuls of calcium would you take from the container and add to the blood? What is the correct amount of this vital substance that must be added to one liter of blood?

You will never encounter this situation; the example has been given just to emphasize the importance of the amount of calcium in the blood. If a liter of blood were placed before you containing no calcium, the amount of calcium you would have to mix with it would be one tenth of a gram. In the five liters of blood in your body, there needs to be a total of only half a gram of calcium. If there is any more or less than this, serious illness or even death may result. Clearly, the human body has been created in a marvelously delicate balance. A person weighing 80 kilos requires only half a gram of calcium circulating in his blood—any more or less, and he will die.

Calcium ensures the operation of several vital functions in our bodies. Without calcium, the blood would not clot and a person could die from blood loss from to a small wound or even a scratch. Calcium also plays an important role in the transmission of nerve impulses. If nerve impulse transmissions were severed, death would result. Calcium also ensures that the muscles function and that the bones are healthy. The body of an adult person contains up to two kilograms of calcium, and of this, ninety-nine per cent is stored in the bones. The remainder is used in functions relative to body metabolism. Approximately 0.5 grams of calcium in the blood is sufficient for bodily functions.¹⁸

As we said before, in 100 milliliters of blood, there is 10 milligrams of calcium—the equivalent of 0.1 gram in a liter. If the proportion falls from 10 mg. to 6-7 mg. (the total amount of calcium in the blood falls by 0.2 grams), tetany occurs, characterized by symptoms of painful muscle contractions and convulsions. These contractions happen first in the heart muscles and the muscles of the respiratory tract. The irregular contraction of these muscles makes the heart beat erratic and inhibits the respiratory function. Without treatment, the patient's heart will stop (or he will not be able to breathe). In either case, death results. As we can see, in order for such vital functions as heart beat and respiration to occur, only half a gram of calcium is needed.

If the amount of calcium in the blood increases to 12 mg. in 100 ml. (that is, if the total amount of calcium in the blood increases by one tenth of a gram), kidney stones could develop, the activity of the nervous system reflex could slow down, and the muscles could atrophy and (as a result) lose their strength. When the amount of

calcium rises to 17 mg. per 100 ml. of blood, calcium phosphate spreads to every part of the body and poisons it.¹⁹ The fact that the human body is so dependent on a substance (and that this substance is used in several of this body's functions) demonstrates two important points: that human beings are created according to a wonderful plan, and that they are totally dependent on God Who created them.

After we have seen the importance of the amount of calcium in the blood, this question inevitably comes to mind: what is the mechanism that determines this amount that is so vital for life? The answer to this question reveals another wonder of creation. Buried inside the thyroid gland is another hormonal gland called the parathyroid. In order to ensure the balance of calcium in the body, this gland, working cooperatively with others, puts a highly intelligent plan into effect. The only function of the parathyroid is to measure how much calcium there is in our blood; it does this day and night throughout our whole lives, to keep the proportion of calcium at the ideal level.

Through the agency of a specially designed hormone that it produces (parathormone), the parathyroid regulates the level of calcium in the blood. If the level of calcium in the blood drops, it immediately secretes parathormone.²⁰ This demonstrates a very important point: at the beginning of this section we asked whether you could determine the amount of calcium in a container of blood placed in front of you. We determined that, without laboratory devices specially designed for this task, you would not be able to succeed. Yet the tiny parathyroid can make a calculation that humans cannot do except in a laboratory. The cells that compose the parathyroid gland not only produce a hormone, but they also make measurements relative to the place where the hormone will be used.

How does a cell pick out the calcium atoms in the river of blood flowing in front of it? How can cells without eyes, ears or hands recognize calcium atoms among the millions of kinds of other substances in the blood such as salt, glucose, fat, amino acids, proteins, hormones, enzymes, lactic acid, carbon dioxide, nitrogenous waste, sodium, potassium, urea, uric acid, iron and sodium bicarbonate? How does a cell recognize calcium? How does it know how much calcium there should be in the blood? With what consciousness does it measure the calcium? With what intelligence does it decide whether there is too much or too little calcium present? Cells are tiny, only one percent of a millimeter in size, without conscious intelligence. The fact that they can successfully measure the amount of calcium in the blood is in itself a miracle.

Taking the Necessary Steps

Put yourself for a moment in the place of the cells that measure the amount of calcium. Imagine that your only job throughout your whole life, day and night, without stopping, sleeping or resting, is to calculate the amount of calcium in the blood. This will give you a better idea of the importance of the wonderful work these cells do.

If the parathyroid cells conclude as a result of their measurement that the amount of calcium has fallen too low, they immediately secrete parathormone. At this stage, the cells demonstrate another conscious activity: They "understand" that the level of calcium has fallen and take appropriate action to restore the deficiency.

Put yourself in the place of the parathyroid cells and think: If you were aware that the calcium level in the blood had decreased, what remedy would you use to increase the level of calcium?

To answer this question you would have to be a scientist with every means at your disposal to investigate the human body. If people had no knowledge about calcium in the body, it would be necessary to do years of

research and receive assistance from the best biochemists in the world. There would be only one purpose for this effort—to find sources of calcium that could be used in the body.

Finally, at the end of your research you would learn that there is a great amount of calcium stored in the bones and that some calcium leaves the body in the urine. You would learn that calcium comes into the body from food through the intestines.

In the light of this, the three measures you could take to increase blood calcium are:

1. Borrow some of calcium from the bones.
2. Find a way to recover the calcium excreted in the urine.
3. Arrange to have more calcium taken from the food.

But each one of these functions takes us into a different field of expertise.

Before deciding on the first choice, you would have to persuade the bone cells to lend you a portion of the calcium they have stored in the bones. The bone cells (osteocytes) do not want to lose any of the calcium, which is very important to the bones. However, you must find a chemical formula that will allow the bone cell to release some of its stored calcium into the blood. In order to find this formula, you will have to be aware of all the chemical secrets of the bone cells down to the smallest detail and also the process by which the calcium is stored. Then you will have to devise a molecular formula to reverse this process. Moreover, you will have to obtain in a moment all the information pertinent to the inner structure of cells whose secrets human beings have been trying to discover for a hundred years. At the end of your lengthy researches, you will find the miraculous formula to persuade the bone cells to liberate some calcium—that formula is parathormone. (See figure 1)

But there are still other things you have to do. You must find two other formulas to ensure that the second and third functions are carried out.

To make the second choice feasible, you must persuade the cells in the kidneys to conserve the calcium in the urine and mix it with the blood again. Normally, there is no necessity for these cells to search for calcium in the urine. This time you must solve all the mysteries in the inner workings of kidney cells, which are quite different from bone cells. Then, you must find one molecule in an endless combination of molecules that can activate the kidney cells to find calcium in the urine. Finally, if you manage to produce this special formula, you will have witnessed one of the greatest wonders in the world, and the formula you obtain is exactly the same as the first formula you discovered—parathormone. Molecules having the same formula are able to make cells perform two totally different functions, a wonder that cannot be explained by the operation of evolution.

Now there remains a third thing you must do. You must get the body to retain more calcium from the food that it consumes.

The mixing of the calcium in the food you eat with the blood occurs in the small intestine, but in order for the calcium to be reabsorbed, the intestinal cells need "activated vitamin D." Here, a major problem arises, because the vitamin D you obtain through your food is inactive.²¹ In order for your intestines to absorb more calcium (therefore, to increase the amount of it in the blood), this problem must be solved. A special molecule must exist that will change the chemical make up of inactivated vitamin D and activate it. Again, you must do much research and many experiments in order to design a special molecule that will activate the vitamin D. At the end of your research, you will find the formula of the molecule needed to activate the vitamin D (and to ensure the absorption of calcium by the cells of the intestine) is the same as the formula of parathormone.

Think about this: Three different unrelated ways have been discovered to increase the amount of calcium in the blood, but the key to causing these three different systems to function is the same—this key alters the

operation of the three systems. What is more surprising is that, when the operation of these three systems (with their very different structures and ways of functioning) is changed, the result is the same—the amount of calcium in the blood increases.

The fact that three different systems begin to work with the same key toward the same goal is a proof of the perfection and incomparable harmony of God's creation.

When the amount of calcium in the blood falls, the parathyroid cells demonstrate an incredible awareness. Using the appropriate key to alter the operation of each of the three systems, they ingeniously produce one molecule—parathormone.

In this way, they raise the level of calcium in the blood by ensuring that the bone cells release calcium, that the kidney cells extract more calcium from the urine, and that vitamin D is activated so that the digestive system can obtain more calcium.

How did the parathyroid cells find this ingenious formula? How do they know that this molecule will affect the bones, the kidneys and activate vitamin D? How is it that in the countless numbers of people who have lived in the course of history, the parathyroid has managed (except in cases of illness) to produce the right formula? How do the parathyroid cells know that the bones store calcium, that there is calcium in the urine that would be wasted, and that the cells of the small intestine need activated vitamin D to absorb calcium? How do they come up with the formula to make these three systems function? How do unconscious cells perform this feat of intelligence, which human beings could never manage?

Surely, the One Who manifests this intelligent design displayed in cells, Who creates cells, the calcium molecule and human beings from nothing, Who creates human beings in such a way that they need calcium, and Who also provides for this need with a perfect system is God, the Lord of the heavens and the Earth and of all that is in between. God's Majesty is exalted:

God, there is no god but Him, the Living, the Self-Sustaining. He is not subject to drowsiness or sleep. Everything in the heavens and the Earth belongs to Him. Who can intercede with Him except by His permission? He knows what is before them and what is behind them but they cannot grasp any of His knowledge save what He wills. His Footstool encompasses the heavens and the Earth and their preservation does not tire Him. He is the Most High, the Magnificent. (Qur'an, 2: 255)

A Control Mechanism

In earlier pages we have seen that a large part of the functioning of the hormonal system is under the control of the pituitary gland, but it will be noticed that the system in place to regulate the amount of calcium operates under the direction of a different control mechanism. The parathyroid glands measure the amount of calcium in the blood and decide what action to take. If the amount of calcium in the blood is too low, they secrete parathormone.

If the amount of calcium in the blood is more than is required, the secretion of parathormone is reduced. This time a different hormone comes into play: the thyroid gland secretes a hormone called "calcitonin," which has the reverse effect of parathormone. That is, it prevents bone cells from releasing calcium and makes them store it.

The cells which make up the parathyroid gland know that they must go into action when the amount of calcium decreases, while the cells which compose the thyroid gland know that they must become active when the level of calcium increases. Who put this plan into the cells?

If the parathyroid went into action at the wrong time, when the amount of calcium was already too high, and parathormone began to be secreted, a serious danger for human health would result. Or, if parathormone and calcitonin were secreted at the same time, the body cells would not know what to do. If the cells that make up these glands were slow to go into action when the need arose (or did not notice that they were needed) a serious danger to health would again result. The harmonious functioning of the thyroid and parathyroid glands and the intelligence guiding the activities of the cells that make up these glands, are all proof that the human body was created.

THE SUGAR FACTORY IN OUR BODIES

If you ate food containing a little more sugar than you needed, a system in your body would go into action to prevent the elevation of the proportion of sugar in your blood.

1. First, the pancreas cells would find and distinguish the sugar molecules from among all the millions of other molecules in your blood. Moreover, they would count the sugar molecules to decide if the number were too high or too low. Amazingly, cells too small for the eye to see, without eyes, hands, or a brain know the correct proportion of sugar molecules in a fluid.

2. If the pancreas cells determine that there is more sugar in the blood than required, they decide to store the excess. But they themselves do not do the storing; they have other cells, located far away, to do this job.

3. These distant cells, unless a command to the contrary comes to them, have no desire to store sugar. But the pancreas cells send a hormone to these cells commanding them to store sugar. The formula of this hormone, called insulin, has been coded in the DNA of the pancreas cells from the moment they come into being.

4. Special enzymes in the pancreas cells (worker proteins) read this formula and produce insulin accordingly. In this production hundreds of individual enzymes perform a different function.

5. The insulin produced reaches the target cell by the most reliable and rapid communications network—the bloodstream.

6. The various cells that read the command to store sugar written in the insulin hormone obeys it unconditionally. As a result, the doors that permit sugar molecules to enter the cells are opened.

7. But these doors do not open randomly. The reservoir molecules distinguish sugar molecules from among all the hundreds of other molecule types in the blood; they intercept them and lock them inside themselves.

8. The cells always obey the commands sent to them. They do not misunderstand this command and try to intercept the wrong material, or to store more sugar than is necessary. They work with great discipline and effort.

When you drink some tea with too much sugar, this remarkable system goes into action and stores the excess sugar in your body. If this system did not function, the level of sugar in your blood would rapidly increase and you could eventually go into a coma. This wonderful system can even work in reverse when necessary. If the level of sugar in the blood falls below normal, the pancreas cells produce a different hormone called glucagon. Glucagon sends a command to those cells that were storing sugar and causes them to release it to be mixed with the blood. The cells that obey this command release the sugar they had stored.

How can it be that cells without a brain, nervous system, eyes or ears can manage to make such a complex calculation and carry out their function perfectly? How can these unconscious cells formed by the coming together of proteins and fat molecules do things too complicated for humans to achieve? What is the source of this remarkable awareness demonstrated by these unconscious molecules? Surely all of these delicate operations taking place in our bodies show us the existence and power of God Who rules over the universe and all living things.

THE ADRENAL GLANDS

A lmost everyone knows that there are two kidneys and that they are of vital importance, but most people do not know that there are two small pieces of tissue, weighing only 5-6 grams each, on top of both kidneys that are also of vital importance.

When we examine these glands, called the adrenal glands, each one is two separate laboratories. The first of these is the external part of the adrenal gland (the adrenal cortex), which produces three different hormones; the second is the internal part of the adrenal gland (the adrenal medulla), which produces two different hormones. The hormones produced by these glands are so important that the secretion of too much or too little of them results in death.²²

The Fight or Flight System

Some people owe their lives to a miraculous hormone called adrenaline: when these people are in danger, this fluid makes them stronger, more agile, faster and more attentive. It even doubles their physical capacities as if they had drunk a very powerful potion to give them strength. For example, a pilot notices a mechanical failure in his plane while flying. After a mechanical failure, which threatened to bring down his plane, a heroic pilot lands safely at the airport, saving the lives of hundreds of passengers. But there is a very important point that journalists usually fail to add: what saved the lives of the pilot and the passengers was that marvelous fluid mentioned above.

The fluid sent an alarm to the pilot's brain cells, causing more blood and sugar to be sent to his brain and made him more alert. At the same time, it increased his heartbeat and blood pressure, enabling him to move faster and be more attentive. His respiratory system capacity increased so that he could utilize more oxygen (and more blood could flow to his brain and muscle cells). His muscles and limbs became more intensely focused and the increase in the level of sugar in his blood gave him the extra energy that he required.

Adrenaline (epinephrine) is produced and stored in the adrenal medulla—the inner portion of the adrenal glands. Everyone has this hormone in him all his life; you have it in you right now. If it is needed, the adrenal glands will produce it so that you may become stronger, faster, and much more alert. If you are in some danger, you will be given about twice your normal strength to enable you to fight against the source of the danger (or to run away) to save your life.

Although such an important hormone, the concentration of adrenaline in the bloodstream is surprisingly small compared to the work it does. It has been calculated, for example, that if the amount of blood in our bodies were compared to a lake 100 meters in diameter and two meters deep, the adrenaline in our blood would be the equivalent of one teaspoon of fluid poured into the lake.²³

The powerful effect of a small amount of this fluid on the human body is the result of wonderful design. When we look at the functional system of an adrenaline hormone, we more clearly understand the perfection of God's creation.

The physical requirements of a normal person will certainly not be the same as that of a person in danger. Consider the needs of a person who is confronted by a dangerous situation: he must run fast, his muscles must work more quickly, his blood pressure must rise, and his heart must beat more quickly. So, he will be able to run faster, escape more quickly or fight more strongly against the danger. How does all this happen?

When the danger occurs, an alarm button is pushed in the body, and the brain sends a lightening-fast command to the adrenal glands. The cells in the interior section of the adrenal gland then go into alarm mode and secrete adrenaline hormone to deal with the emergency. The adrenaline molecules mix with the blood and disperse throughout the various areas of the body.

Adrenaline molecules have a special function in the veins and arteries that ensures the vital organs receive a greater supply of blood at the times of danger, and to do this, they dilate the blood vessels going to the heart, brain and muscles. The cells surrounding the vessels obey the adrenaline and supply the extra blood required by the heart. In this way, the extra blood needed by the brain, muscles and heart is supplied.²⁴

While dilating the blood vessels going to the heart, brain and muscles, adrenaline constricts the vessels that supply the liver and the skin to ensure extra support needed by the body. There is another reason for the reduced amount of blood pumped to the skin: in the likely case of a wound, the amount of blood loss would be reduced. The reason for paleness observed in the skin in times of excessive excitement is because less blood is pumped to the skin then.²⁵

An error never occurs that dilates the vessels going to the heart (or the brain) that constricts vessels going to the liver (or skin); the adrenaline molecule knows what it must do. A microscopically small hormone adjusts the diameter of the hundreds of blood vessels in your body where the blood is to be directed.

For every organ in the body, the action of adrenaline is different; when the adrenaline molecule goes to the blood vessels, it causes them to dilate; when it goes to the heart, it quickens the contraction of the heart cells. This makes the heart beat faster and supplies the extra strength that the muscles need.

When the adrenaline molecule reaches the muscle cells, the muscles can contract with much more strength. The adrenaline molecules that go to the liver command the cells located there to mix more sugar with the blood. This causes the amount of sugar in the blood to increase and supplies the extra fuel needed by the muscles.

This activity of the adrenaline hormone in the body requires a great amount of intelligence, knowledge and skill. This tiny molecule knows what it must do and when; when the body does not need it, the alarm mode is never set into operation. Apart from this, it knows very well to which cells it must go, and what kind of command it must give to them. Moreover, this shows that it is well acquainted with the cells, with the organs and their functions, and it never makes an error as to when the body must be taken out of this emergency mode.

If it made such an error, the body would be irreparably damaged. But these little molecules function with a keen awareness of their responsibility. How is it possible for an unconscious, lifeless fluid, without a brain, eyes or knowledge, and composed of a certain combination of atoms too small for the eye to see to act in such an intelligent, organized, and timely way?

This clearly shows that every molecule in our bodies is created by God and that, throughout our lives, every moment's activity is controlled by God's power, will and command. After knowing how the body works in detail, no one with intelligence can claim that living things, cells, hormones, molecules or atoms are the purposeless works of chance. God's power, strength and sublimely intelligent knowledge, witnessed to by creation, are manifested in every place and at every moment. As the Qur'an says:

What is in the heavens and in the Earth belongs to God. God encompasses all things. (Qur'an, 4: 126)

Ten Million People and One Gram of the Hormone Aldosterone

In order to survive, countless balances must be preserved in your body every moment. As a person lives his daily life, he is not aware of any of these balances. For example, at this moment various systems are adjusting your blood pressure. The "aldosterone" hormone produced in the adrenal glands has the duty of preventing a fall in your blood pressure and adjusting the sodium balance in your body.

In your body exists as little as one gram in ten million of aldosterone. Research has shown that from one ton of adrenal glands, only ten milligrams of aldosterone is secreted.²⁶ In order to obtain one gram of aldosterone, it would be necessary to collect the aldosterone secreted from the adrenal glands of a total of ten million people. The human body is created in such a delicate balance that a deficiency in such a small quantity of this hormone results in death.

As explained above, aldosterone has two purposes: to increase the concentration of sodium (Na⁺) in the blood and to raise blood pressure. These two requirements are intimately connected to each other and aldosterone is a finely designed solution for meeting these two needs at the same time. If the quantity of sodium in the blood increases, the fluid level in the blood also rises with it. This is because molecules of water have a tendency to go where sodium is high.

Here is where we see the excellence of the design of aldosterone. On the one hand, it increases the amount of sodium; on the other, it uses the capacity of sodium to absorb fluid. When the blood level of sodium falls, aldosterone warns the cells in the tiny tubes of the kidneys. These cells intercept the sodium ions in the urine and reabsorb them. This causes the sodium ions to enter the cells forming the tiny tubes, and from there they are released again into the blood.

In this way, the amount of sodium is raised, the ion balance is maintained, the amount of fluid in the blood is increased, and blood pressure is restored to its normal level. When the sodium ions in the tiny tubes of the kidneys are restored, potassium ions (K⁺) are secreted from the blood to the urine because the proportion of sodium and potassium in the blood must be at a very particular rate. The mineral proportion is very important to ensure the proper acid-base balance in the fluid inside and outside the cells, and for the proper functioning of the nervous system.

Aldosterone is produced in the exterior portion of the adrenal gland. The cells in this portion have never seen the cells in the depths of the kidneys (and there is no possibility for them to encounter them). How is it that these cells know how to produce the right hormone for the reabsorption of sodium and the release of potassium? How does the adrenal gland know how to balance electrolytes and reduce the blood pressure? Most people are unaware that such ions exist in their own bodies.

Every cell in the human body is created to fulfill a special function; they are given their special qualities and placed in an area where they can perform this function. In short, a human being is created, and every feature of his body is a proof of this creation.

He to Whom the kingdom of the heavens and the Earth belongs. He does not have a son and He has no partner in the Kingdom. He created everything and determined it most exactly. (Qur'an, 25: 2)

A Flawless Planning

The next system we will examine is a wonder of planning and design. As we examine the workings of this system, we must ask, "Could this system have come into being as the result of unconscious chance?"

This question is important because time, chance, and the results of natural law are the reasons offered by history's worst deceit for its denial of the existence of God; the theory of evolution bases its account of the development of living things on this foundation.

The deceit of evolution claims that human beings and everything else ultimately came into existence by chance. However, the system that we are about to examine is, by itself, enough to reveal the real nature of the myth of chance and to show the deceitful enterprise of evolution.

The system is constructed so that it will come into operation when there is a blood pressure drop. It begins its role when the blood pressure drops below a certain level, like a fire alarm sensor specially designed to detect smoke coming from a fire.

When the blood pressure falls, the alarm sounds because low blood pressure can be very serious. When the alarm sounds, a series of measures must be taken to raise it. These measures include the following:

1. The blood vessels must be constricted. (This constriction will cause a rise in blood pressure, as is the case when a garden hose is compressed in the end.)
2. More water must be absorbed from the kidneys and mixed with the blood to raise the blood fluid level.
3. A person must be made to drink water as soon as possible.

A flawless system has been placed in the depths of the human body to put these measures into effect. At the moment when the blood pressure falls (or the amount of sodium in the blood becomes less), certain cells in the kidneys become aware of the problem. The Juxtaglomerular cells secrete a very important substance called "renin."²⁷

It is a wonder that cells can detect a drop in blood pressure or in the amount of sodium present and then secrete renin, the first link in a long chain that raises blood pressure.

In blood plasma, there is a protein that normally has a neutral effect as it circulates in the blood. This protein, called angiotensinogen, is produced in the liver. The first stage of this incredible planning starts here. Angiotensinogen and renin have no functions of their own, but they were designed specially to unite with one another. How is it possible that they are specially produced like logo blocks designed to fit perfectly into one another?

Consider this: kidney cells and liver cells are far removed from one another. How is it that one of these groups of cells produces one part (renin) and the other group produces the other part (angiotensinogen) in such a way as to fit perfectly with the first part? Could this happen as the result of unconscious chance?

Certainly not! It is not possible that such a process could occur by chance.

Renin changes the composition of the angiotensinogen molecule, causing the emergence of a new molecule, angiotensin I:

Renin + Angiotensinogen Angiotensin I

This new molecule has no function either. Found in the lungs, an enzyme called angiotensin converting enzyme (ACE for short) functions to break down the angiotensin I molecule. Because of this enzyme, angiotensin I changes into a different molecule, angiotensin II.

Angiotensin I + ACE enzyme Angiotensin II

Two different molecules produced in the kidneys and the liver act on each other and a new molecule is produced. Lung cells that have no relation to kidney cells and liver cells produce an enzyme to unite completely with this new molecule. Moreover, they produce this enzyme long before it unites with these molecules. How do lung cells produce the right enzyme for a process that has not yet developed to interact with a material that has not yet been produced? How does it know how to make an enzyme that will change a non-functional hormone into a functional hormone?

Again, it is clear that each stage is a designed system. The angiotensin II produced as a result of these stages is a proof of design and planning. This enzyme has two vital functions that would lead the system to the desired end result: the first of these functions is the constriction of the blood vessels (the first of the three desired results that we enumerated at the beginning of this section). Angiotensin II stimulates the muscles surrounding the blood vessels and activates the mechanism that contracts these muscles. In this way, the muscles contract, narrowing the diameter of the blood vessels and raising the blood pressure.

Could this happen by unconscious chance?

Again, this is impossible; Angiotensin II is specially designed to constrict the blood vessels and there is no room for chance in this flawless design.

Another important function of angiotensin II is to summon into action the wonderful aldosterone hormone. Angiotensin II reaches the adrenal glands and gives the command to secrete aldosterone. This is another proof of planning: when aldosterone mixes with the blood, it causes the kidneys to absorb the fluid in the urine.

As a result, the blood pressure will rise. This is the second result we want to achieve.

The material produced in concerted effort (and according to a plan by the kidneys, lungs and liver) brings about the secretion of the hormone causing a rise in blood pressure. In order to do this, it is necessary that the kidney cells, lung cells and liver cells form a coalition.

Before all else, this coalition must investigate what they need to do when blood pressure drops to make a decision about the best way "to constrict the blood vessels" and "to ensure the secretion of aldosterone."

Later, they must again make an investigation and analyze the anatomy of the adrenal glands and that of the cells in the muscles of the blood vessels and determine the way in which they function. Later, they will have to determine the molecular make-up of Angiotensin II to cause the muscles of the blood vessels to contract, and the adrenal glands to secrete aldosterone.

That last thing that must be done is to determine how this molecule will be produced. Every organ must take responsibility for one stage in its production. In terms of the production plan, there is a three-stage assembly system in which every organ is given a function. The kidney will produce renin, the liver will produce angiotensinogen and the lungs will produce ACE. Afterwards, the cells must return to their normal roles.

If someone does not believe that this system was created by a supreme power according to a special plan, that person must accept the view that unconscious cells achieved this by the mechanisms of neo-Darwinism (mutation and natural selection). The claims of evolutionists are unbelievable and illogical because this system

(comprised of the kidney, liver and lung cells), which is irreducibly complex, must have come into being all at once at the same time. The probability of this happening by chance would require very unlikely events. At the same time (and again ultimately by chance), cells would have had to be formed to measure the pressure in the kidneys, then aldosterone would have had to be formed in the adrenal gland, the kidney tube cells would have had to acquire a structure designed to respond to aldosterone, and the cells in the muscles of the blood vessels would have had to get a structure that could be affected by angiotensin II. Countless other elements would have had to be in place *at the same moment* for this system to come into being, and if just one element had been absent, the whole system would not have functioned.

A system as this could not come into being as a result of unconscious operations of chance. This system, created by the eternal intelligence and knowledge of God and placed in the human body, has worked perfectly in the bodies of every one of the millions of human beings that have ever existed (except in cases of illness). Human beings have become aware of the existence of this system through research done with the help of sophisticated technological tools. Every bit of research that is done makes it impossible to explain the existence of the systems operating in the human body in terms of the myth of chance. This is because human beings are created, and it is not possible to hide the magnificence of creation by creating imaginary and illogical scenarios.

At the beginning of this section, we listed three measures necessary to increase blood pressure. The third was the necessity of getting the person to drink more water. In order to get a person to drink water, he must want to drink it. This time, the unconscious cells of the lungs, kidneys and liver deep in the body must influence a person's psychology.

The required plan is just one more detail in the flawless system created by God. The angiotensin-II produced by the concerted efforts of the kidneys, lungs and liver goes to a special part of the brain and activates it. This area of the brain is the "thirst center" that stimulates a sense of thirst. But there, an impediment called the "blood-brain barrier," which protects the brain makes it very difficult for the angiotensin II to pass from the blood to the brain tissues. This protective system is found in several areas of the brain, and one of these is the "thirst center." Thanks to the special character created in angiotensin-II, it is able to stimulate the thirst center and to arouse the desire to drink water.²⁸

Can this system have come to be by the operation of unconscious chance?

After so many proofs, there is nothing left to say to a person who answers "Yes." The heart and conscience of such a person has been blinded; he has been conditioned not to accept the truth. God reveals in the Qur'an what is to be said to such a person:

... Do you then disbelieve in Him Who created you from dust, then from a drop of sperm, and then formed you as a man? He is, however, God, my Lord, and I will not associate anything with my Lord. (Qur'an, 18: 37-38)

A Miraculous Medicine (Cortisol)

Shortly, we will examine the aspects of another marvel—a hormone called "Cortisol." But this hormone has such a varied function in the human body that we must note a point before we begin.

The fact that a hormone can activate a cell is in itself a wonder because, in order for a hormone to affect this cell, it must activate the inner systems of the cell. This happens either by attaching to a receptor on the membrane of the cell, or by direct entry into the cell and activating a mechanism inside. But in each case, it is necessary that the hormone molecule be specially designed for the cell it will act on. If there is the slightest incompatibility in the structure of the hormone molecule and its receptor, the cell will not be affected. For this reason, the relation between the hormone and the receptor on the cell it affects has been compared to a lock and a key.

When we examine the effects of cortisol, we discover a very important fact. God has created security systems in the human body and He has placed locks in the cells of each of these different security systems; only a single key can open these locks. For example, this key can be inside a capillary cell, or it can also be in a liver cell. This allows different cells to go into concerted action towards a common goal. No doubt, this is an example of God's artistry in creation; it is also a proof of the evolutionist deceit. The fact that different cells are programmed to work together towards a common goal, and that there is a central system that makes this program work, shows once again the invalidity of the myth of chance as proposed by the theory of evolution.

The cortisol hormone works inside the human body fighting on different fronts against pain, wounds, infection, overheating, hypothermia, allergies, lack of oxygen, hunger, and factors that increase body temperature.

As we examine the functions of cortisol, we must not forget that unconscious cells that cannot know where it will be used produce this hormone. These cells can never be consciously aware of the fronts on which cortisol fights.

Now, let us examine briefly the functions performed by this wonder called "cortisol" produced in the adrenal glands, and let us see once again how the artistry of God is manifested in the aspects of the human body. At each stage, ask yourself if this system could have come into being by evolution, and the answer will show the real nature of the theory of evolution.

The Functions of Cortisol

It takes measures in advance to heal wounds:

Adrenaline prepares a person for the moment of danger, whereas cortisol prepares the human body for what is likely to happen after the danger has passed. For example, it mobilizes the amino acids to go into action in the case of a wound.²⁹ At the moment a wound occurs, these amino acids are the raw materials that will be used in the reconstruction of the tissue.

It reduces the sense of pain when a wound occurs:

This is the reason that some people do not feel pain at the time they receive a wound (and even for some time afterwards).³⁰ As a result, a person can find the strength to defend himself, run away, or fight even though he has been wounded.

The sense of pain is communicated by the nerve cells. But how do the cells that produce the cortisol know the mechanism that slows down, and partially stops the electrical impulses of the nerve cells?

In times of emergency it converts fats and proteins into sugar:

In order for body and brain cells to be nourished, sugar is required; all cells need a continuous supply of sugar, otherwise, the person will soon die.

When someone is hungry, if there are no nutrients from which sugar can be obtained, the amount of sugar in the blood will drop. In this situation, cortisol comes into play and does not allow the body to remain without sugar. It ensures the conversion of stored fats and proteins into sugar, keeping the level of blood sugar within safe limits.³¹

Fat or protein (or both) are converted to sugar. This function is really highly complex. To change one material into another is to completely alter the composition of the molecules. If a fat molecule or a protein molecule were enlarged trillions of times and placed on a table, most persons would not know which atoms had to exchange places with others. However, inside the cells are refineries that accomplish this change through a very complex operation. The cortisol hormone knows the stages in the process of this change. It is designed to open the lock that will allow this change to begin. How do the cells that produce cortisol know the shape of the key required to start the operation that will convert fat or protein to sugar? How do they know what operation is needed to convert the formula of the fat molecule ($\text{CH}_3\text{-(CH}_2\text{)}_n\text{-COOH}$) into the formula of the sugar molecule (CH_2OH)?

In emergencies it gives priority to the nourishment of the brain and heart:

Cortisol molecules go into operation in emergencies and produce a drop in the body's utilization of sugar. But here is another wonder; the effect of the emergency is not felt on vital organs such as the brain and the heart. To give an analogy, just as in times of emergency, economic resources are deployed in particular areas of a nation, so the cortisol molecules give a mobilization order and give priority to the nourishment of the heart and the brain, curtailing the nourishment of other cells.³²

How do cortisol molecules know that some cells are more vital than others?

It arranges the contraction and constriction of the blood vessels:

Earlier we saw that blood vessels are not rigidly fixed pipes, but because the muscles around them can contract and relax, the diameter of the vessels can be changed when the need arises. The command to become narrow reaches the blood vessels by means of various hormones. Cortisol arranges the response of the blood vessels to the constricting and dilating factors that affect them, and thus performs another important function in emergencies.³³

How does cortisol know the system according to which the muscles around the blood vessels contract, and how can it organize the response of these vessels to the contraction-dilation factors of the system?

It checks the movement of water:

Cortisol prevents fluid from entering cells when it is not required. Thus, it helps to maintain the stability of the blood volume. How does a cortisol molecule know that fluid has a tendency to enter the cells? And how does

it know the methods required to keep the fluid outside? More importantly, how does it determine when fluid must be kept outside the cells, not all the time, but just at those times when it is necessary?

In times of danger, to prevent a rise in body temperature, it inhibits the production of the relevant hormone:

Another wonderful effect of the cortisol hormone is seen in the case of high fever. A rise in body temperature is a sign that the human body is fighting an illness. This rise in temperature requires that a person rest and sleep. The rise in temperature is not a side effect of the sickness; fever is a specially adjusted security precaution to force a person who is fighting an illness to rest. The rise in temperature is caused by the "temperature center" in the brain, which is activated by a substance called IL-1 (interleukin).

Cortisol is also designed to deal with excessive body temperature. When a person is in danger of death due to high body temperature, cortisol lowers the temperature by inhibiting the production of IL-1, which activates the temperature center.³⁴

How does cortisol know that IL-1 raises a person's body temperature and that high body temperature is dangerous for a human being? How does it know where IL-1 is produced and how does it make a decision to inhibit its production?

It organizes the production of some proteins, which are very important for human life:

When you are in a difficult situation, cortisol takes all your needs into account separately, one by one. It increases the production of hemoglobin, white corpuscles, and thrombocytes in the bone marrow and thereby raises their blood levels.³⁵

A single molecule too small for the eye to detect has a number of particularities, skills and responsibilities. For this molecule to perform its functions, it must have been specially designed for these special tasks. This hormone is another instance of the harmony and flawless design in God's creation.

... My Lord encompasses all things in His knowledge so will you not pay heed? (Qur'an, 6: 80)

SEX HORMONES

For a certain time after they are born, male and female children resemble one another. But after years, differences begin to emerge in the bodies of each. A beard appears in males, their voices deepen, their shoulders widen, and they come to have the typical features of the male body. Girls begin to take on the typical female form. Two bodies that resembled each other closely, except for the sex organs, take on quite a different appearance after the secretion of the sex hormones in adolescence.

What brings about the change in male and female bodies are the sex hormones that God has created in a highly organized manner.

The main sex hormone in the male is testosterone; in the female, they are estrogen and progesterone. When we look at the mechanisms by which these hormones are secreted, we meet a few other wonders of creation.

Sex hormones are secreted in the male testes and in the female ovaries. But the system that ensures this secretion is located very distantly from these organs, in the pituitary gland and the hypothalamus area.

Many years from the time of birth pass before the sex hormones go into action. But when the right time comes, when the child has reached the age of adolescence, the hypothalamus sends a command (the GnRH hormone) to the pituitary gland. The fact that the hypothalamus does not make a mistake in timing (unless damaged) is remarkable. How can a small piece of flesh take account of days, months and years without a calendar (or more precisely, without the conscious intelligence required to understand a calendar) and do everything with perfect timing? This fact is a proof that the hypothalamus has been designed by God in a way to properly affect this timing.

After receiving the command, the pituitary gland secretes two hormones, LH and FSH. The target areas of these hormones are the female ovaries and the male testes. These hormones give a command to these organs to "go into action" after years of being inactive.

The testes and the ovaries then begin to produce the sex cells proper to males and females and to secrete the sex hormones. The LH and FSH hormones in men and women have the same molecular structure, yet each is responsible for different processes in the male and female bodies.

In the section entitled "Hormones That Are Able to Regulate Time and Produce the Differences between the Sexes" we examined the wonder that these hormones have different effects and that they wait years to be secreted.

Now, let us examine how the male and female reproductive systems develop and see what kind of system God has created for each new human being that has come into the world.

The Female Reproductive System

The most important organ in the female reproductive system is the ovary, each of which weighs between 10-20 grams. The ovaries make the egg cell that is half of the newborn person. (The other half is the sperm cell that comes from the male body.)

Another function of the ovaries is to produce sex hormones. This is a very important function because these hormones make a child's body a woman. This function resembles a sculptor making a statue, but the hormones are not outside the body as the statue is outside the sculptor's body, rather, (in the case of the hormones) the statue is formed inside the body.

The sex hormones produced in the female body, for instance, cause the pelvis bones become wider because during pregnancy, it will make the needed room for the baby in the mother's womb.³⁶

How do these cells that produce the female hormones know that the woman may later get pregnant? If they had this knowledge, how will they tell the cells which form the pelvis bone how much they must multiply to widen the proper amount? How do they know the right size for the pelvis bone?

Moreover, in women, the accumulation of fat in the hips and thighs is again physically the result of the influence of estrogen. In a male child, it is not fat that increases in the developmental stage, but the striated muscle mass. In women, the increase in the amount of fat is specially adjusted to store the energy that will be needed for the time of pregnancy and milk production.³⁷

The sex hormones cause the development of a high voice in women and low voice in men.³⁸ How do the hormone molecules know the difference between a male and a female voice? How is it that they can decide that a male voice has to be low and a female voice high? And how do hormones, with the same formula, produce a high voice in women and a low voice in men?

It is a demonstration of great wisdom that female hormones are not secreted until a particular age. Female hormones come into play when the female body is mentally and physically mature; that is, when the time comes when it can carry a baby, and it has the intelligence and maturity to bring it up.³⁹ This arrangement is certainly another proof that human beings have been created according to a definite plan.

A Four Week Period of Life

Every four weeks in the body of a healthy woman, a comprehensive preparation occurs. This preparation is brought about by cells in the woman's body in order to bring a new human being into the world.

As a mother considers her child's every need, its health and development and makes long-term plans for it, the cells that make up the mother's reproductive organs show the same degree of care for the egg cells. In order to ensure the fertilization of the egg cell, they carry out long-term plans, and the most important factors affecting this plan are hormones.

Just before this four-week period, the pituitary gland secretes the LH hormone. After this hormone leaves the skull, it sets out on its long journey via the blood stream and reaches the ovaries. Now the time has come for the ovaries to go into action.

Inside the ovaries are thousands of immature egg cells. Under the influence of the LH hormone from the pituitary gland, part of these egg cells begins to mature. Normally, only one of these developing cells will fully mature and be released from the ovary as an egg cell. (If two cells are released and each one is fertilized, twins will be born)

The egg cell in process of development with its surrounding nutritive layers is called a "follicle." The FSH hormone sent by the pituitary gland has a major effect on the follicle, suddenly causing it to produce a special molecule. This molecule is the estrogen hormone.

How is it that the follicle, which is itself not fully developed, has begun to produce a hormone? What is the purpose of this production? The answers to these questions bring us to another proof of creation.

The estrogen produced by the follicle shows once again the wonder of creation. Let us look briefly at its functions:

1. One of the targets of the estrogen hormone is the "uterus." This is where the fertilized egg will lodge, multiply and grow. The influence of estrogen causes the uterus to prepare for pregnancy; its wall increases 3-4 times in thickness and is surrounded by capillary vessels. If fertilization occurs, these vessels will supply the required nutrients.

This is a wonder because the still developing follicle cannot consider the future of the cell inside it, yet it takes the required measures needed for the future nutritional needs of the egg. It also ensures that preparations are made in the uterus where the egg will be protected.

After releasing the egg, how does the follicle know that it will reach the uterus and lodge there? How does it know that capillary vessels in the uterus will provide nutrients for the egg cell? From whom did it learn the formula for causing an increase in the number of capillary vessels?

2. Under the influence of estrogen, the muscles in the uterus begin to develop and their strength increases. This is a measure taken to protect the place where the egg will lodge in case of fertilization.⁴⁰

3. The growth in the women's breasts during the time of development is closely connected to the influence of estrogen. Estrogen increases the accumulation of fat in the breasts and, at the same time, ensures the multiplication of milk glands.⁴¹ All these preparations ensure that the baby will be fed by the mother.

4. The construction of other parts particular to a woman's body also happens as a result of the influence of estrogen. Of interest is the fact that estrogen causes growth in a woman's breasts but never goes to produce growth in the shoulder area except in extraordinary cases (which would give a woman a masculine appearance).

Estrogen also produces the high pitched woman's voice instead of a male voice. It knows what kind of voice needs to be produced and it knows how to make a woman's voice. The sculptor that forms the special features of the woman's body is "estrogen."

5. At the same time, estrogen facilitates fertilization. At the end of the second week, when it is the best time to fertilize the egg, the amount of estrogen in the blood rises significantly. This results in the secretion of a special fluid from the uterus to the vagina. This fluid captures the male reproductive cells, the sperm, within itself and carries them upward. It increases the activity of the sperm and carries them towards the egg cell.

6. Unless special measures are taken, the mother's womb is a highly septic environment. This presents a serious threat to the health of the mother and the unborn baby. Estrogen ensures that this threat is eliminated. When estrogen molecules reach the epithelial cells in the mother's womb, these cells begin to secrete an acid. This acidic environment is a suitable environment for the multiplication of beneficial bacteria (*Döderlein's bacillus*) and, at the same time, it protects the vagina from infections.⁴²

The chemical molecule produced by a tiny follicle not only gives shape to a human body from head to toe, but also makes the required arrangements for a new human to be born. However, estrogen is a lifeless material that is formed from the arrangement of atoms. It is produced by unconscious cells and it affects other unconscious cells. But all of these operations happen in the context of a wonderful and flawless plan, at the end of which a boy or a girl is born. The intelligence that creates this human being belongs to God.

O mankind! Heed your Lord Who created you from a single self and created its mate from it and then disseminated many men and women from the two of them. Heed God in Whose name you make demands on one another and also in respect of your families. God watches over you continually. (Qur'an, 4: 1)

Preparations to Meet the Egg Cell

When the mature egg enters the second period of its four-week life (about 14 days later), it is released from the ovaries. Now, the egg cell begins its journey to the mother's womb. If it is fertilized during this journey, it will begin a new life; if it is not fertilized it will die and be expelled from the body.

When the egg cell leaves the ovary and starts its journey, it is still supported by the inside of the ovary it left behind and also by the pituitary gland located at a far distance from it. The pituitary gland knows that the released egg needs help and secretes a special hormone called LTH. This hormone travels by way of the blood to the ovaries and affects the mass of cells called the "corpus luteum" in the ovary, which in turn secretes progesterone.

The progesterone hormone has a special design and a very special purpose. This hormone, although it never leaves the ovaries and never sees the world outside them, influences cells located far distant from it, ensuring that these cells act according to a definite plan. This is yet another example of the wonder of creation that occurs in the human body.

When progesterone molecules reach the uterus, they cause, as in the case of the estrogen meeting the egg cell, that certain preparations are made. In one sense they increase the strength of estrogen.

Progesterone also affects the ovary itself, by preventing a new egg cell from being released. Otherwise, as an embryo was developing in the mother's womb, a second egg cell would be fertilized, producing a great danger both for the developing embryo and the mother.

How does progesterone know that, after fertilization has occurred, a second fertilization must not happen and that it is necessary to stop the activity of the ovary to prevent it? Who gave this ability to progesterone, which is only a molecule?

Another special function of progesterone is to diminish the influence of the oxytocin hormone secreted by the pituitary gland. As we saw earlier, oxytocin is a hormone that goes into effect as the time of birth approaches and ensures that the uterine muscles will contract. As a result of these contractions, the baby comes out of the mother's womb more easily.

If oxytocin affected the uterus during the first days of fertilization, these muscles would eject the fertilized egg as it attached itself to the uterine wall, and pregnancy would never occur. Progesterone goes into effect at this stage and inhibits the influence of oxytocin, preventing the fertilized egg from being ejected. Progesterone is amazingly designed to negate the effect of oxytocin.

How do the cells, which produce progesterone, know about the existence of oxytocin? Remember, progesterone is produced by cells inside the ovary. Oxytocin is produced far away from ovary, in the pituitary gland located in the skull. How did oxytocin learn what causes the uterus to contract, and that the fertilized egg could be ejected? What intelligence designed the progesterone molecule to prevent this?

The planning here demonstrates the existence of an intelligence that did the planning. And, in order for this planning to be done, this intelligence must know all the detailed aspects of the human body. God, Who has created human beings with all their special characteristics, has created an ideal harmony in the progesterone-oxytocin mechanism.

Progesterone has another special feature, which is still another proof of the helplessness of human beings before God Who created them.

The moment a fertilized egg cell reaches the wall of the uterus and begins to grow there, it becomes something foreign in the mother's body. The immune cells in the mother's body would inevitably attack this group of cells as they multiply. This attack would end the life of the baby even before it began and pregnancy would never occur.

But progesterone prevents the cells of the immune system from attacking the zygote in the wall of the uterus. Besides its other functions, progesterone also protects the developing group of cells from being attacked. Certainly, this shows once again that progesterone was created by a high intelligence, that is, by God.

As noted earlier, secretion of progesterone occurs in the second half of a four-week period. If fertilization does not occur in this period of time, the amount of progesterone and estrogen in the blood quickly decreases because it is no longer necessary to make preparations for a new human. These preparations (the multiplying capillary vessels to feed the fertilized egg in the wall of the uterus) are expelled from the body, a process called menstruation.

The secretion of the FSH hormone four weeks later in the pituitary gland corresponds to a new egg cell that begins to mature in the ovary, and another new four-week preparation period starts.

The Male Reproductive System

Hormones also play a key role in the male reproductive system. About 10 years after birth, when adolescence begins, male hormones come totally into play. This happens when a chain of command is established in the body. At the top of this chain of command is the hypothalamus.

After birth, the hypothalamus secretes a hormone called LHRH every 3-4 hours, but the amount secreted is very small. About ten years later, the hypothalamus actually "understands" that the time has come to begin the shaping of the male body and begins to secrete LHRH in smaller intervals.⁴³ The LHRH hormone moves to the second link in the chain of command, the pituitary gland. As soon as the pituitary gland receives the command, it secretes another hormone called LH. This hormone gives the command to activate the male sex glands, the testes.

Why do all these functions take so long to begin and how can we explain the timing of these mechanisms? The answers to these questions are still unknown to the world of science. In any case, this system (whose secrets human beings have not been able to solve) has operated since the beginning of history in the body of every human being.

When the LH hormone reaches the testes via the bloodstream, the cells there begin to produce a hormone called testosterone. The cells that produce testosterone know the time has come for the body they occupy to pass from childhood to manhood. The chemical formula of the testosterone they produce will turn a developing child into a man.

Testosterone molecules disperse to various parts of the body and know what they must do to certain cells in these areas. Some of the functions of testosterone in forming the male body are as follows:

Testosterone molecules cause the multiplication of muscle cells. For this reason, the male body is more muscular and stronger than the female body. The increase in muscle mass gives the male body its characteristic appearance.

At the same time, testosterone molecules affect the cells in the roots of the hair, causing the beard and mustache to appear. The hairline on the forehead is drawn farther back.

Testosterone affects the vocal cords causing a male voice to be lower than that of a woman. In addition, the testosterone molecule gives the male body its ability to fertilize the female egg.

Certainly it is surprising that an unconscious molecule can do all this. This molecule knows the particularities of the male body and directs trillions of cells in the formation of this body.

Testosterone molecule is not limited to these things. Clear evidence of design can be seen in the mechanism by which this hormone exerts its influence. In order to bring about its effects, testosterone reaches the targeted tissues (the male genital organs) and enters the cells. Inside the cell, it unites with an enzyme specially created for it whereby its effects are greatly increased.

This newly formed hormone then unites with a special receptor designed specially for it. The resulting molecular combination unites with the cell's DNA and uses the information received from the DNA to bring about a new protein synthesis. This operation ensures that the distinction between male and female bodies, and their different sexual functions, will continue.

This is such a flawlessly created system that the mechanism formed from the three-fold union of testosterone-enzyme-receptor finds the place allotted to it from among the numberless data codes contained in the DNA and, on the basis of this information, ensures production. For example, for the growth of the beard, they act on the relevant regions in the DNAs of the hair root cells. To lower the voice, they act on the appropriate region in the DNAs of the vocal cord cells.

The information given here is extremely important. Testosterone ($C_{19}H_{28}O_2$) is a molecule produced from carbon, hydrogen and oxygen atoms. How does this unconscious, lifeless thing know that the information it needs to perform its function is located in the DNA? Even more important, how can it find so quickly (and accurately) the few letters it is looking for from among three billion letters (enough to fill thousands of volumes of an encyclopedia) in the DNA? The hundreds of scientists, who have worked for ten years with the most advanced technology on the Human Genome Project, are only today able to map the DNA. But they still do not know which section of the DNA is related to which organs, proteins or hormones of the human body. However, estrogen ($C_{18}H_{24}O_2$) and testosterone ($C_{19}H_{28}O_2$) know this very well and have applied what they know without error throughout countless years in the bodies of numberless individuals.

Certainly this system is a miracle of creation that demonstrates God's artistry.

Testosterone is produced by the LH hormone secreted from the pituitary gland. But the LH hormone is just as much under the control of testosterone as testosterone is under the control of LH. When the amount of testosterone in the blood increases, testosterone molecules exert pressure on the pituitary gland to cause them to cease producing LH. Only when the amount of testosterone decreases does the production of LH begin again. The LH produced activates the testes and orders extra production in order to raise the amount of testosterone.

From this we can clearly conclude that there is an exchange of information between the pituitary gland and the testes. Two unconscious glands control each other's production and cooperate to ensure the secretion of

the ideal amount testosterone for the human being, and prevent any danger that might arise from the secretion of too little (or too much) testosterone. More exactly, within the two glands molecular sub-systems are placed so as to ensure their harmonious cooperation. This flawless design shows that these systems were created to fulfill a common purpose.

At the same time, the FSH hormone secreted by the pituitary gland begins the production of sperm in the testes. Sperm cells are specially designed for the fertilization of egg cells. Another example of design is that, with the beginning of adolescence, FSH is secreted and sperm starts to be produced at just the right time.

Two Different Sexes From the Same Raw Material

Male and female sex hormones have a common characteristic. The male hormone, testosterone, and the female hormones, estrogen and progesterone, are made from the same raw material, cholesterol.

How is it that cells using the same raw material manage to form different sexes? A testis cell gives shape to the raw material that it is given and forms male characteristics; with the same raw material, an ovary makes the estrogen and progesterone that produce female characteristics. The same substance, just because of the modifications given to it by a cell, causes the growth of the beard, the widening of the shoulders, the lowering of the voice, and the production of sperm. Again the same substance, because of the different shape given to it by another cell, causes the widening of the female pelvis bone, the growth of breasts, the raising of the vocal pitch and the preparations necessary to give birth to a child.

Cells without intelligence use the same raw material to produce molecules, each with their own flawless design (and each one destined for a very different purpose).

This one example is enough to show the greatness of the intelligence manifested in these tiny cells too small to be seen by the naked eye.

It is God Who created the seven heavens and of the earth the same number, the Command descending down through all of them, so that you might know that God has power over all things and that God encompasses all things in His knowledge. (Qur'an, 65: 12)

COMMUNICATION WITHIN THE CELL

Up to this point, we have examined how cells communicate among themselves and the means by which one cell sends its message to another. We touched on the functions of these messages (hormones) and the effects they have on cells. In this section we will examine how the message carried to the cell by a hormone is transferred from the cell's membrane to its nucleus. In other words, we will examine the communication system inside the cell.

The Communications Center in a Cell and Its Stations

Most of us are familiar with high communications towers, and many of us have seen television news reports of the opening of such installations. The first impression that these images leave on our minds is probably the image of a structure full of antennas and complicated electrical devices. This idea is not mistaken because, in order to understand the technological devices used in these installations, one must have a certain engineering expertise in electronics and communications. Besides this, almost all of us believe that these facilities are now indispensable in enabling us to establish communication with people in every part of the world. Just think of this: What would happen if all the communications towers, with their centers and stations, were to shut down for a short time? There is no doubt that this situation would cause great chaos and anxiety. But, no matter how much material damage might result, it could still be repaired.

However, if the communication between our hundred trillion cells, or the communication within one cell, were to shut down for just an instant, and the cellular messages were not to reach their destination, the result would be death. Modern communication systems are established using electronic and mechanical devices with the most advanced technology. However, the advanced technology of the inner communications systems of cells, which is too advanced for human beings to fathom, is constructed with the use of devices structured from protein. Inside protein there are no electrical circuits (or even semi-conductors) as exist in modern devices; in their place are atoms of carbon, hydrogen, oxygen and nitrogen. There are an estimated 30,000 different proteins in our body and of these, the function of only two percent is completely understood.⁴⁴ The function performed for human beings by many proteins is still largely unknown.

The communications system among cells in some ways resembles systems used by human beings. For example, on the membranes of the cells there are "antennae" that allow them to sense the messages that come to them. Immediately under these antennae are "power stations" which decode the message sent to the cell.

These antennae are located on the one hundred thousandth of a millimeter thick cell membrane that surrounds the cell. This receptor, which is known as "tyrosine kinase," is composed of three basic sections: the antenna, the body and the tail. The shape of the part of the antenna that projects out from the cell membrane resembles a dish antenna used to collect satellite transmissions. Just as each dish antenna is designed to receive certain satellite transmissions, there are different receptors that understand the language of the messages carried by various hormone molecules.

The messages coming from different cells/hormones come into contact with the antennae on the cell membrane, but each antenna is designed to sense only one single message. This is a very special instance of design and because of this, a message cannot be sent in error to another cell.

The great harmony in which hormones and antennae are created in relation to one another can be compared to the lock-and-key relation observed in almost all biological activity. Only the right key can open the lock; that is, only the right cell will have anything to do with the message sent, this message being without meaning for other cells.

At the moment the hormone reaches the cell, it sets an incredible system into motion. By means of a very special communications system, the message coming to the cell is sent to that cell's DNA. The cell is then moved in action according to the message.

In order to understand just how wonderful this operation is, think about an ordinary occurrence that everyone can encounter in their daily life. Information is sent via the Internet to a personal computer connected to a network of other computers. The information sent to the computer is transmitted to another unit, for example, to a printer, and the printer puts the information on paper. People have been using computers since the 1980's; they are used at home and in the workplace and, since the mid 90's, the Internet has become a part of people's lives. If you read in a newspaper one day that a computer has been built that was too small for the eye to see, and that this computer was communicating with other computers, your reaction would be quite different. Perhaps you would not believe that this technology could be compacted to such a small size. However, in real life there is a communications system with a technology much more highly developed than this, working in an area too small for the eye to see.

The fact that a message coming to a cell's antennae is transmitted at great speed to the nucleus of the cell, and that a highly advanced technology is employed in the process of this communication, is a much greater wonder than a microscopically small computer. This is because a cell is a piece of flesh and your whole body, from your eyes with which you are reading this book to your hands you are holding it with, is formed by cells working together. In the body of each one of us, there are 100 trillion small organisms possessed of a highly advanced communications system. Now let us examine the system by which the message reaching the cell is transmitted inside the cell, and let us see the wonder of creation manifested in a piece of flesh one percent of a millimeter in size.

The Journey of a Message-Carrying Hormone Inside the Cell

When a messenger molecule reaches the cell, it attaches to the antenna on the cell's membrane. In the course of this attachment, the message is relayed to the antenna. The message received by the antenna is then transmitted to the tail located in the inner section of the cell. The body of the microscopic communications antenna enters the fluid (cytoplasm) between the nucleus of the cell and its membrane. The connection established between the hormone and the antenna initiates a chemical reaction. This reaction causes the antennae, which were individual units, to form into groups of two, and brings about a change in the shape of the tail sections. This operation, called "phosphorilation," is a change that occurs when the enzymes in the body section add phosphate to the tail.

Several molecules and proteins add technical support to this system. For example, the GTP molecule and the proteins called "G" for short, have an important effect at this stage; they supply the phosphorous for the phosphorylation. For the system to function, it is necessary that many factors come into play at the right moment.

This operation carried out by the enzymes has an important role in the relay of information. This operation within the cell is intended to be a call to the proteins known to be communication modules in the cytoplasm. As a result of a number of complex operations, the SH2 communication module is activated, and a connection is established with the tyrosine kinase antenna, which stimulates the relay of this message within the cell.

Until recently, no one had any idea of how the messages carried by hormones reached the nucleus so speedily and with such precision. How is it that no error is made in the course of the transmission of the message? Indeed, the slightest error made in the process of the transmission of a message would cause, for example, a faulty protein production in the cells and the collapse of a marvelous physical system. The latest research has shown the existence of communication modules in cells. The SH2 module is only one of an estimated hundreds of different communication modules.

Within the cells, these modules function as communication stations. Thanks to the wonderful system that they have established, messages are carried from the membrane of the cell to its nucleus. From one point of view, these fantastic modules can be compared to base stations that establish communication with cell telephones. In this way, enzymes that work in an ordered fashion deep in the nucleus of a cell take measures to ensure that production occurs according to "ideal standards."

Modular Communication Stations

Research done on these communication stations has surprised scientists. The structure of the modules is composed of proteins, each made up of 100 amino acids. Each one of these has a particular three-dimensional structure. As a result of this marvelous design, every protein can establish a connection with a certain module. That is, just as every radio station broadcasts on a different frequency, different messages are relayed by different cell communication modules.

The idea of a "module" used here to describe the bits of protein that form the communication pathways in the cells is really an insufficient comparison. This analogy explains that these three-dimensional molecules fit into each other as do separately manufactured parts of a pre-fabricated house. What amazes scientists is the structure that emerges as a result of adding phosphate onto the receptors is a shape with which the SH2 module can bond completely. Thanks to this, the SH2 module and the receptor can fit into one another as if they were designed for that very purpose.

With the help of an electron microscope capable of enlarging an object one million times, some stages have been observed which enable us to understand the microscopic communication stations, but scientists inform that there are still hundreds of communication modules whose structures are not yet understood.⁴⁵ These cohere closely with one another and form an inerrable system of signals within the cell. If one of these modules were not in place, or if it were faulty, communication within the cell would be completely paralyzed; this shows how extraordinary this system is.

This marvelous communication system in the cells has a few "expert modules" that take the message they have received from receptor on the membrane directly to the relevant gene in the cell's nucleus. That is, these

modules have such a flawless design that they find the section of that information contained in the DNA molecule relevant to the message they are carrying (enough information in a human to fill a million encyclopedia pages). In this way, they ensure that the amount of protein required by the cell is produced without error. That a piece of protein one millionth of a millimeter in size can be so clever and aware is a wonder.

All of these investigations show that the cytoplasm of the cell is full of various organelles and proteins, and, once again, that the cell is the most complex structure in the universe. The internal communication system of the cell is an example of this. Certainly, the splendid order in the world of cells is the order of God, the Lord of all the worlds.

The Control Mechanism in the Communication Within Cells

Different hormones have their own particular effects on their target cells; this is necessary if the human body is to function in an orderly way. For example, the messages carried by insulin and glucagon—the hormones that adjust the level of sugar in the blood—are completely opposite in structure to one another. For this reason, these two hormones stimulate different communication pathways in the cell. The receptors that function like a communications station inerrably find the communication module to relay the message.

If a wrong choice were made at this stage, the communication network would fail and the person may die. But the receptors on the cell's membrane work like experts, ensuring that communication continues without interruption.

How do receptors that are stimulated by different hormones select without error the messenger proteins with which they must unite? How do the receptors successfully perform their functions without making a fatal error? Recent scientific research has helped us to find the answer to these questions. The flawless communication within the cells comes from their perfect design.

Let us consider the SH2 module about which we know most. This small piece of protein is composed of two main parts. One section of SH2 is the part that attaches firmly to the tail of the receptor. The second section of SH2, the section that gives it its basic characteristic, operates like a code reading device.

The number and arrangement of amino acids in the tail section of the receptor forms the code of the message being brought to the cell. This code is only deciphered by a certain kind of SH2 module. It is this same module that unites with it. Another section of this module unites with a different module. In this way, a special line of communication is established between the membrane and the cell nucleus. In short, all these complicated operations do not happen at random; they are organized according to a definite system. This arrangement is another demonstration that everything has been created in a measured and harmonious way.

Now, in order to observe an example of this harmony, let us examine the communication mechanism that goes into action to repair the area where a person has cut his hand. In this situation, a messenger molecule called "platelet derived growth factor" (PDGF) unites with the receptor of the smooth muscle cell in the blood vessel that has received the damage. As a result of this union, the tail of the receptor inside the cell binds to a protein called Grb2. Grb2 is a messenger protein formed from the union of SH2 and SH3 particles; in order to establish communication among the proteins, it takes on the function of an adaptor. Next, Grb2 assimilates a messenger protein called "sos" which is in the cytoplasm that contains enzymes. Sos then activates another protein named

"ras." In this way, at the end of a number of operations, it sends instructions to the relevant genes in the cell. Then the cells begin to multiply in order to heal the wound.⁴⁶

Scientists make the following evaluation based on their research: in the communication system of the cells are mechanisms that automatically prevent a malfunction. These mechanisms are the product of superb design much more advanced than the control systems employed by modern high technology. So it is that, ever since the creation of human beings, hormones, receptors, adaptors, proteins and microscopic elements have been operating in perfectly harmonious cooperation.

It is impossible to conclude that such a complex order has come to be by evolution. The complexity of this system is extraordinary and more advanced than a communications system established by an international company, with branches, production and marketing centers all over the world. Above all, it is not conscious, informed, educated and intelligent human beings who operate this wonderfully integrated communications web, but tiny molecules too small for the eye to see. Certainly it cannot be expected that molecules establish such a system among themselves. The One Who established this system and controls it is God.

Special Messengers in the Cells

If you asked your friends what was the most important communications event of our time, "the Internet" would most probably rank first. Then, ask them why they think this. They will tell you that internet technology has made it possible for a great amount of information to be transmitted from one end of the world to the other within a short time. Internet technology is one of the most important developments in the history of humanity, but it is also true that the speed and capacity of information transmission afforded by the Internet is slow compared to the transfer of information among cells.

The nerve cells in the brain cells (neurons) or eye cells actually have the fastest known capacity for the transfer of information.

In these cells are systems functioning at every moment to make the transfer of information fast and without error. The latest research on the communication web of nerve cells has shown that some proteins in neuronal pathways have an "incredibly large number of linker domains."⁴⁷ Therefore, these proteins are able to hold groups of messenger proteins together permanently. The very rapid communication in nerve cells is the result of this special design.

As an example of the special proteins that have a role in the communications mechanism in the world of cells, we will consider PSD-95. This messenger protein is thought to be an agent in the neurons related to learning.

In the linker modules of the PSD-95 protein are three PDZ domains. The first of these attaches to the tail of the receptor in the cytoplasm; the second controls the ion channel in the membrane of the cell; the third grasps the messenger proteins in the cytoplasm. In other words, the linker modules in the structure of PSD-95 makes it possible for it to coordinate several elements of communication at the same time.

This wonderful communication system is not limited to the nerve cells; a similar system exists in our eyes. You are reading this book due in large measure to the rapid communication system in the cells in your eyes. This marvelous mechanism is also found in the eyes of animals. Research on fruit flies has demonstrated that in this creature's compound eye containing many smaller eyes, special communication modules exist. The operation

model of the special "InaD" messenger protein that causes the transfer of visual messages from the eye to the brain of a fruit fly is outlined below.

How did proteins establish such intelligent and particular communication systems? And how is it that proteins have constructed communication networks to respond immediately to the different needs of 100 trillion cells? And again, how did the wonderfully designed module system agree among themselves and formulate plans to form complex structures?

The modular system in the world of cells can be compared to the International Space Station. This station, built on the modular system, is recognized as one of the greatest engineering achievements in human history. No one can claim that this space station came to be by the chance combination of atoms, molecules, wind, lightening, or solar energy. The fact is, this space vehicle was built as a result of highly intricate engineering calculations, based on a pool of knowledge built up over the years by scientists from many countries.

Who made this communication system working inside cells whose technology is so advanced those scientists cannot completely unlock its secrets?

The messenger proteins and the wonderful communication systems formed by them are created and ordered by God, "**He created all things**" (Qur'an, 6: 101) and "**directs the whole affair from heaven to Earth.**" (Qur'an, 32: 5).

The Scientific World and Cellular Communication

In the last part of the twentieth century there were enormous scientific advances in the field of cellular communication. Huge steps were taken towards an understanding of the communication networks in the depths of our bodies. For example, if we look at the awarding of the Nobel prizes over the past twelve years, six of the awards given in this period in the field of medicine were to research done in the field of cellular communication. The systems we have described so far are a part of the wonders discovered as a result of this research.

How far have we come in the year 2003? How much farther does the scientific world have to go? The answer to this question is very important because the answers we give will help us to understand that this cell communication system is a great wonder of creation.

In various countries of the world are many organizations, with a total budget of millions of dollars that are researching this matter. Towards the end of the year 2000, the Alliance for Cellular Signaling (AFCS) was established. Twenty universities and hundreds of scientists belong to this organization, and its founder, Alfred Gilman, was awarded the Nobel Prize in 1994 for his work in cellular communication. Professor Gilman had this to say about this subject:

If the brain needs sugar, the liver has got to put it out. If the muscles need more blood, the heart has got to beat faster. Hundreds of different chemical signals flow around the body, released from one cell to influence the activities of other cells. Cells are constantly being bombarded with very large numbers of chemical signals that tell them what to do and how to perform... The bigger problem, and the one that is most difficult to figure out, is how all of these modules interact together.⁴⁸

And the AFCS, beginning its work towards this goal, explained their enterprise using this comparison;

The Alliance will launch voyages of discovery aimed at two continents (cardiac myocytes, B lymphocytes). We know a little about the coastline of each continent—a few harbors and mountain ranges near the coast

(receptors, ligands, and crudely sketched signaling pathways). We will thus concentrate first on exploring the coast more thoroughly, at the outset with more attention to the harbors that we know best (e.g., G protein-coupled receptors and heterotrimeric G proteins) but not neglecting many we know less well (receptor tyrosine kinases, cytokine receptors, etc.). Mapping the interior of the continent begins with expeditions to inland areas nearest the coast (cytosol), following rivers and trade routes (critical nodes of signaling pathways already known). Further exploration will radiate out from these nodes, and later expeditions will push further into the interior (cytoplasm to nucleus)...⁴⁹

The fact is, as the paragraph above shows, the information that we have at our disposal regarding cellular communication is quite limited and that, in the years ahead, microorganisms will increase our knowledge of other systems.

There are scientists who speak clearly and sincerely on this subject. One of these is the 1999 winner of the Nobel Prize in medicine, Günter Blobel who did research on the "zip code" system in cells. This world-renowned professor said the following in an interview on this subject:

It's shocking how little we know about how a cell works . . . And that will take a long, long time to figure out.⁵⁰

The twenty-first century will, as science advances, allow us to learn more incomparable wonders of communication within our cells. For a person of understanding, every system that is being discovered is a demonstration of God's eternal wisdom and power, and a sign that reminds us that the only Being worthy of praise is God.

THE ZIP CODE SYSTEM WITHIN CELLS

A cell, with all its organelles that act in perfect harmony and order within it, has amazing characteristics. Professors at the Swedish Karolinska Institute said that the organization of a cell can be compared to that of a big city such as New York.⁵¹

When we investigate proteins, which are the building blocks of a cell, we discover some important facts: Every cell contains over a billion or so protein molecules consisting of thousands of different kinds.⁵² In order to get an idea of this huge sum, imagine this example: at the rate of one per second, in order to count a billion proteins, it would take 32 years of continuous and accurate counting. If you take into account your unavoidable need to eat and sleep, your life would probably not be long enough to count the proteins in a *single* one of your cells. There are about seven billion people in the world, and each person has about 100 trillion cells in his body. Therefore, the number of protein molecules that exist in the world is too great for us to count. Moreover, these proteins are constantly being renewed in every individual; about once every month they disintegrate into the amino acids of which they are composed and are again resynthesized according to the needs of the cells.⁵³ They are reconstituted as a result of the complex operations described by the term "protein synthesis." Some of them are composed as enzymes and are present in nearly every stage of all the complex reactions in the cell; some of them form messenger hormones; some assume special duties in the organization of vital functions, such as carrying oxygen to the blood, stimulating the cells to action and adjusting the level of sugar in the body.

What we want to concentrate on here is the flow of protein traffic that happens when newly produced proteins change their place in the cell. Because some of these proteins begin to be used immediately within the cell, they must be carried to the place where they are to be used; others are sent to a protein storage area of the cell for later usage. Proteins that will be used outside are removed from the cell under the supervision of the cell membrane. In the meantime, proteins that enter the cell from outside, again under the supervision of the membrane, form an important part of this dense protein traffic. In short, within the tiny parameters of a cell there is an incredible amount of activity. Even rush hour traffic in a large city where millions of people live is really at a standstill compared to the dynamism in a cell. Moreover, this dense activity is carried on by our proteins that are about one millionth of a millimeter in size, that inhabit our cells that are one hundredth of a millimeter in size. It is extraordinary that billions of tiny units of matter fit into a space too small to be seen by the naked eye, and that each one of them is made to run back and forth with great order and harmony to perform their important functions. It is necessary for the continuance of life that this cell traffic flows perfectly. Every protein, either those produced by the factory called a "ribosome" or those that are introduced from other cells have a special place where they will be used. The proteins needed by an organelle, for instance mitochondrion, are different from others. If we consider the organization of a large city, this situation can be compared to the fact that the various production facilities in a city have different needs.

The fact that, within a cell one hundredth of a millimeter in size, a billion proteins are moving at every moment, brings these questions to mind: How do the proteins produced know where they must go? How do they reach the organelles where they are to be used or the target cells outside the cells where they were synthesized without losing their way? How do they come out from inside the membrane that is composed of a fat layer tightly surrounding the organelles? How does this surprisingly dense cell traffic function without an accident?

Let us consider the matter again for a moment substituting a newly born human being for a newly produced protein. Let us give some written and spoken advice to a new baby born in an imaginary city with a billion inhabitants as to where it can find food and clothing, how it can find what it needs, and where it can find a job. Certainly a baby does not know the environment in which it was born; it would not be possible for it to find by itself any place in such a remarkably crowded city. In order for it to find its way without getting lost, it would be necessary for this person to spend years in this city, getting to know it. In order for a person to achieve such a thing he would need a long time; it is certainly surprising, then, that a protein without intelligence or consciousness can do this perfectly.

The secret of how proteins can overcome the obstacles they encounter and find the right address is hidden in the expert design of the cells. Latest research in the science of cells has revealed some wonderful mechanisms in the micro-world of cells.

How is Protein Traffic Within Cells Organized?

Everyone knows that a zip code system is designed to increase the efficiency of communication by getting a letter to the correct address as quickly as possible and with the fewest errors. The really interesting thing is that research has shown that a similar mechanism exists within cells.⁵⁴ It is known that proteins are synthesized by the planned union of hundreds of amino acids. A special section of between 10 and 30 amino acids form a kind of chain that forms the zip code of the protein. In other words, the zip code written on the envelope is composed of numbers and letters, while the zip code in a protein is composed of amino acids. This code is located on one of the ends of the protein or inside it. As a result, every new protein that is synthesized receives instructions as to where it will go inside the cell and how it will go there. Now, let us examine under a highly advanced microscope the journey of a protein within a cell.

When we look at how a newly synthesized protein, goes to its proper place—for example, endoplasmic reticulum—we see the following: First, the zip code is read by a particle of a molecule called SRP. SRP (Signal Recognition Particle) is a structure especially designed to read the zip code and to help the protein find the channels through which it must pass. It interprets the code in the protein, binds to it and shows it the way like a real guide. Then, the SRP and the protein lock into a protein passage channel and a receptor on the membrane of the endoplasmic reticulum specially designed for them. When the receptor is stimulated in this way, the channel on the membrane is opened. At this stage, the SRP separates from the receptor. All these operations occur with perfect timing and harmony.

At this point, the protein encounters a problem. It is known that proteins are formed when the amino acid chain bends and contorts into a three-dimensional shape. In this situation, it is impossible for protein molecules to pass from the membrane of the endoplasmic reticulum because the passage channel on its membrane is only 0.000000002 meter in diameter. But here we see the existence of a perfect previously designed plan because this problem has already been solved in the production stage. The ribosome that produces the protein produces it in the shape of an uncontorted chain. The structure of this chain makes it possible for the protein to pass through the channel. After the passage is complete, the channel is closed until another passage occurs. The work of the code section in the protein that enters the endoplasmic reticulum comes to an end. For this reason, this section is separated from the protein by particular enzymes; afterwards, the protein folds and takes on its final three

dimensional appearance. This situation is like what happens after the letter has reached its destination; the function of the zip code written on the envelope comes to an end. How these enzymes can act consciously and know which of the hundreds, sometimes thousands of amino acids on the protein they will tear off is another wonder. If they tear off any one of the amino acids that make up the protein, other than those that compose the code, the protein may become useless. As we see, at every stage many particles act with consciousness and responsibility. It is a plain fact that this conscious sense of responsibility cannot belong to tiny molecules.

The fact is that the cooperation among the molecules that have a role in these complex functions—proteins, SRP, protein zip codes, ribosomes, receptors, protein channels, enzymes, plasma membranes and other complex functions not touched on here—is flawless. The zip code system in the cell is by itself a great proof of creation. This system that has been used for forty years by human beings has been operating in the trillions of cells in the depths of the bodies of the millions of individuals since the creation of the Prophet Adam (peace be upon him).

The Howard Hughes Medical Institute is known for its research in the field of cellular communication. The president of the Institute, P.W. Choppin, stated that the discovery of the code system in cells is one of the most important discoveries in modern biology. "Günter revealed that each protein has its own 'molecular bar code,' which the cell reads and then guides the protein to the correct location." Choppin has said.⁵⁵

The bar code system is not something unfamiliar; we encounter its use frequently in our day-to-day lives. On the back cover of this book you will find an example. Nearly everything in your refrigerator or kitchen cupboards has a bar code on it. In many sectors it is indispensable. This system, which is composed of side-by-side parallel vertical lines, relies on a laser scanner for its interpretation. The laser scanner relays information to a computer and facilitates the performance of a few complicated functions. In brief, the bar code system is a method designed and developed to make our lives easier.

There is no doubt that the bar code has been developed as a result of the special programming and design of the computer and the scanner. This system relies on complex devices, and the harmonious operation of these devices depends on an engineering plan. No one with intelligence and common sense would think otherwise. This being the case, the ideas of those who try to explain such remarkably complex structures as the zip code in the cells (or the bar code system) in terms of chance, display a serious lack of understanding. In the Qur'an, the question is asked, **"Or were they created out of nothing, or are they the creators?"** (Qur'an, 52: 35), and the impossibility of this is emphasized. The probability that one single protein could be formed by itself (or by chance) is zero, not to mention the billion proteins in one cell. Moreover, because it is impossible that these proteins were formed by chance, it is much more impossible that the coordination, cooperation (and harmony) among them come to be, by chance, in such a way as to enable a body to stay alive for years.

There is no doubt that everything, from atoms to molecules, proteins to cells, has been created by the eternal compassion of God and given to our service. Therefore, it is our duty to think deeply about our Lord's boundless mercy and give thanks to God.

The SRP Structure: The Guide in the Cell

Imagine that you are making a very short visit to a foreign country whose language you do not know. In this situation you urgently need a guide that will both allow you to communicate with the local people and help you with your visit without getting lost.

Similarly, there is a particle in cells that acts as a guide for newly formed proteins. This guide is the SRP mentioned above whose complex structure is composed of protein and RNS molecules. On the exterior it resembles a bowling pin only 0.000000024 meter in size.

SRP understands the language both of proteins and of the receptor-entrance channel complex on the membrane of the endoplasmic reticulum. The complicated structure of this guide is not yet completely understood; scientists suspect that the RNA molecule in the SRP has an important role, but they have not been able to understand the function of this molecule yet. Moreover, the intricacies of the relation between the SRP guide and the receptor-entrance channel are still unknown.⁵⁶

A professor of molecular biochemistry known for his research in this field, J.A. Doudna, stated that the relation formed between the protein and the RNA, which is one of the components of the SRP, is a "fascinating network"⁵⁷ and "example of true molecular collusion."⁵⁸ Indeed, this structure is truly amazing because RNA and protein have been created in such a way as to work in flawless harmony with each other, and have been brought together for the performance of a special function. There is no difference in proposing that this design came to be by chance and maintaining that a cell phone came to be by an alliance made by atoms and molecules among themselves. The crystal structure of this protein that became understood only in the year 2000 is, without doubt, a product of superior design. It is an eternal sign of the power and knowledge of God.

Communication and Transportation in the Nucleus

It is known that a cell's nucleus contains a data bank (the DNA molecule) in which all physical characteristics are encoded in their smallest details. Many operations within a cell are carried on with reference to the information in the DNA. Therefore, between the nucleus and the cytoplasm and the various organelles there is heavy protein traffic at every moment. This traffic and communication is organized to respond to the needs of the cell.

The nucleus of the cell is different from other organelles; it is surrounded by a double membrane. On this membrane are located entrance-exit complexes (Nuclear Pore Complexes) used by proteins. These are entrance-exit complexes and not entrance-exit channels because of their structure. Thanks to this special system, comparatively large groups of molecules like RNA and DNA can pass through the nuclear membrane so that the delicate structure of the protein and the molecules are not damaged. When the entrance/exit complex is completely open, they are ten times bigger than the channels in other organelles. Research has shown that there are ten entrances and ten exits every second through each entrance/exit complex.⁵⁹ The entrance and exit of a protein into and out of the nucleus of a cell is completed under the guidance of "karyopherin." This special guide is of various types that bind to the protein and direct it to the entrance/exit complex. Moreover, different proteins and enzymes also have a function in the transfer operation.

This extraordinarily integrated and complex protein transfer system has once again left evolutionist scientists without recourse; Professor Günter Blobel confessed that "the detailed mechanisms for transport across the NPC[Nuclear Pore Complex] are still unknown."⁶⁰ Take, for example, the karyopherin that establishes communication and directs the passage; the scientific articles written on the functions of this one particle fill thousands of pages. The extraordinary design of one single particle is a clear demonstration of creation. If we notice that several guide particles exist with different characteristics and structures, we better understand that God's eternal knowledge encompasses all things.

Unique Systems Whose Secrets Have Not Yet Been Discovered

Every day scientific research sheds light on the various operations of the cell's "zip code" system. A short time ago, it was understood that a system similar to this existed in the immune system and antibodies are produced by this method. Moreover, it is known that a group of special molecules exist that let blood cells leave the circulatory system and direct them to the relevant tissues.

What we know about the incomparable systems in the cells is quite small compared to what we do not know. The Nobel Prize is usually shared by a number of scientists, but in 1999, only Gunter Blobel took the award for his discovery of the zip code system in cells. In an interview done after he received the award, Professor Blobel said:

We are at the level now that we understand many of the basic mechanisms of protein traffic within the cell but we haven't understood them all yet. We are working, for instance, on traffic between the nucleus and the cytoplasm, and we are far from understanding how this traffic is regulated and how it works.⁶¹

The truth is evident. No matter where we go, every point in the depths of space, of the sea, of the forest or in the deep recesses of our bodies is redolent with signs of God's knowledge, art and power. People were unaware in past centuries of the wonders of creation contained in cells; but each one of them captures the imagination today. Every new development in cell biology documents the fact that the claims of evolutionists are deceitful nonsense. At the same time, they show once again that the wonderful order in cells was created by God's single command; "Be" and that they are under His control at each moment. Every detail determined relative to a cell is an occasion for us to exalt the glory and power of our Lord, Almighty God.

His command when He desires a thing is just to say to it, "Be!" and it is. Glory be to Him Who has the Dominion of all things in His Hand. To Him you will be returned. (Qur'an, 36: 82-83)

COMMUNICATION IN NERVE CELLS

I imagine that you are walking bare-foot in your kitchen and you walk on a piece of glass. The amount of time from when you walk on the glass until you feel the pain in your brain is only a few thousandths of a second. This time is so short that you cannot notice it, but during this time, a message was transmitted from your toe to your brain. This rapid and perfect communication was managed by nerve cells or, as they are called in biology, neurons.

Just look around: everything we see is designed according to a special purpose. For example, a telephone with its plastic and electronic parts, buttons, line and other components, has been designed to establish communication with other people. In the same way, the reason for the creation of neurons is evident on first inspection. (Of course, this requires an inspection done under an advanced microscope.) The first thing you notice, along with the other organelles in the cells, is the special extensions on the neurons which resemble arms projecting from a body; these are called axons and dendrites. It is possible to compare a neuron with a high technology telephone central. The size of this cellular telephone central is only between 0.004 and 0.1 of a millimeter, but its communication mechanism is unparalleled in the world today. The axon and dendrites mentioned above provide the communications lines that enable communication with other sites.

The diameter of a neuron is on ten microns on average. (A micron is equal to one thousandth of a millimeter) If we could arrange the 100 billion neurons in the human brain side by side in a line, the line (ten microns in diameter and too small to be seen by the naked eye) would stretch a thousand kilometers. The existence of such an extensive communication network in a brain weighing only 1400 grams is astonishing.

Consider these figures a little more closely. Neurons are so small that fifty average sized ones could fit on the period at the end of this sentence.⁶² It is for this reason that a great amount of what we know about neurons has been obtained indirectly.

When we examine the communication extensions on nerve cells, we see that on every neuron there are many dendrites that transmit communication from other neurons to the body of the cell. Most frequently, the function of the single axon is to transmit the message received from the body of the cell through the terminals and extensions.

At this point, we must point out the special design of axons. A special covering layer called "myelin sheath" encloses an axon. Nerve impulses are propagated at specific points along the myelin sheath; these points are called "the nodes of Ranvier." Research has shown that signals jumping from node to node travel hundreds of times faster than signals traveling along the surface of the axon.⁶³ The sheath and "nodes" on the axon make it possible for the signal to be transmitted in the most suitable and rapid manner.

Neurons establish communication in our bodies by a unique method that comprises extraordinarily complex electrical and chemical operations, ensuring flawless coordination both in the brain and between the brain and other organs. When you complete a simple action, such as holding this book in your hands, flipping its pages or running your eye through its sentences, there is a very dense communication traffic in the nerve cells deep within your body. Examining closely the neurons that establish this extraordinary communication network will help us to understand better what an important wonder of creation they are.

Design in the Synapses

The communication between two neurons happens between connective points called "synapses" located on the ends of the axon terminals. Just as a telephone central allows many people to communicate with one another at the same time, in a similar way, a neuron can communicate with several neurons currently through the synapses. Hundreds of millions of telephone conversations can be made in the world at the same time. Compared with this, it is estimated that there are one quadrillion synapses in the human brain, all which add up to 1,000,000,000,000,000 communications.⁶⁴ This extraordinary communication is an important factor that has led scientists to refer to the brain as "the most complex structure in the known universe."⁶⁵

We can also say this in another way: a typical nerve cell in the human brain, for example, harbors tens of thousands of synapses.⁶⁶ This means that one neuron can establish a connection at the same time with tens of thousands of different nerve cells. Imagine the difficulty you would have talking on two telephones at the same time; this feat by one nerve cell of tens of thousands of simultaneous connections is an example of a marvelous creation.

Until recently, the communication junctions among neurons were thought to be stable, but once again scientists have been surprised by the fact that the shape of synapses change according to the structure of the chemical messenger. Professor Eric Kandel received the Nobel Prize in 2000 for this discovery. This expert design can be summarized as follows: there exists a mechanism in the synapse that alters the form of the synapse according to the strength of the stimulus. When it receives a powerful stimulus, the synapse makes it possible for this stimulus to be transmitted to other cells, undiminished, and in the most productive way. Another important point to be emphasized is that this system was understood after experiments on sea slugs. Professor Kandel himself confessed that the nervous system in human beings and mammals is too complex for research to understand completely.⁶⁷

Chemical Communication in Neurons

Most people think that the connection between neurons is established only by electric signals. This is not true, since chemical communication is an important part of this process. When we investigate the communication between two neurons, we understand better the wonderful elements in chemical communication.

The chemical communication involves of messenger molecules called "neurotransmitters." These are produced in the body of the nerve cell, carried along the axon, and stored in tiny vesicles on the axon terminals. In each vesicle there are about five thousand units of transmitter.⁶⁸ Recent research has shown that neurons can contain and release more than one kind of chemical messengers.⁶⁹ In other words, every neuron is like a chemical plant that produces the messengers that will be used in communication.

The neuron that sends the signal is the "transmitter" and the one to which it is sent the "receiver." The transmitter and receiver neurons meet at the synapse, a space about 0.00003 of a millimeter.⁷⁰ A particular electric signal activates the messengers on the axon terminal of the transmitting nerve cell. The synaptic endings filled with chemical messengers combine with the cell membrane and release the molecules inside them into the synapse cavity. The message carried by the messengers is sent to the receptors on the membrane of the

receiving neuron. Different receptors establish a connection with different messenger molecules. The message carried by the chemical messenger molecules is thus perceived by the receiver neuron.

We have described this system only in rough outline, and every stage of it is filled with operations that have not been completely resolved by scientists. In fact, scientists have had only a murky picture of some of the events relative to this communication.⁷¹

Consider the fusion of the synaptic ending with the cell membrane. The operation described by the word "fusion" is a very special union similar to the connection of a modular unit to a highly advanced computer. The connection of a part to a computer depends on complicated engineering calculations. Otherwise, the part will not fit the computer, and the computer may even be ruined. A cell is much more complex than a computer, and a harmonious union of a neurotransmitter with a cell membrane is not a random occurrence. All these complex operations that happen at every moment are under the control of God Who created them.

The Planning and Timing in the Messenger Molecules

The density of the chemical messengers and the time they remain in the synapse cavity directly influence the communication between the two neurons. Different mechanisms exist for each chemical messenger. Some messengers disperse after they deliver their messages. Others are broken down by special enzymes after they have performed their functions. For example, the messenger molecule called "acetylcholine" is converted by a special enzyme into choline and acetate.

There is yet another marvelous mechanism in the nerve cells: The messengers that transmit a message to the receptor cell are gathered back again into the transmitter cell and are stored there to be used in a subsequent message. This operation is performed by a few special molecules. The activity of the dopamine and serotonin molecules is regulated in this way. If we consider how difficult it is to recycle products, we can better understand the effectiveness of this mechanism in the nerve cells.

Every phase of chemical communication occurs within an incredibly delicate balance. Every messenger molecule used in every communication, and every protein and enzyme that performs a function in the various stages, must be designed. The number of messenger molecules that will be stored, how long the receiver cell will be stimulated, the time for disintegration or reassembly are a part of the necessary communication balances. Moreover, an important number of details relating to communication balances is still unknown.

Parkinson's disease is a condition that destroys muscle coordination, makes movement difficult, and causes tremors. The cause of this disease is the destruction of the balance between the messenger molecules dopamine and acetylcholine. When some nerve cells in the brain produce less dopamine than is required, the result is the loss of muscle control. This fact came to light only recently (Professor Arvid Carlsson was awarded by the Nobel Prize for his discovery).

These delicate balances and complex mechanisms are not composed of a random series of events. The One Who creates them, keeps them under His power, gives them to the service of human beings and takes them back again when He wishes, is God, to Whom belongs eternal power and knowledge.

The Electrical Communication Between Neurons

At every moment, every nerve cell experiences a complex conversion. Communication via neurons is an operation that occurs when electro-chemical or chemical messengers generate an electrical signal.

In order to understand electrical communication, we must first consider another balance mechanism: the marvelous balance formed by the electric charge in nerve cells, the ions. Ions perform an important function within neurons; there is one positively charged sodium and potassium ion, two positively charged calcium ions and one negatively charged chloride ion. In addition, there are some negatively charged protein molecules.

In its resting state, a neuron is negatively charged. In this state, negatively charged proteins and various ions are within the nerve cell. Compared to the number outside, there are more potassium ions and less chloride and sodium ions inside the neuron.⁷² These are not arranged at random, and this proportion is specially determined and maintained.

The message left on the membrane receptors in the nerve cell initiates a serial operation in the cell that is reminiscent of the domino effect. In the course of this operation whose details are not yet fully known, it is thought that hundreds of proteins perform a function. This operation happens serially and in perfect order, causing particular ion channels to open on the cell's membrane. The result is that the sodium ions that are taken inside the cell neutralize the cell that earlier had a negative electric charge (-70 millivolts). The transfer of ions between the inside and the outside of the cell creates an electric signal. The operations that we have described here in the simplest of terms begin and end in less than one thousandth of a second.

The signal that is created travels quickly along the axon and initiates the chemical operations that will pass the message to other cells on the synapse points on the ends of the terminals. The average speed of the signal along the axon is 120 meters per second.⁷³ A simple calculation will show us that this speed equals 432 kilometers per hour.

The nerve cell that transmitted the message completes its task and returns to its resting state. This restoration happens by the opening and closing of the sodium and potassium channels within a period of less than one thousandth of a second. Without a clock produced by means of high technology, you cannot measure one thousandth of a second. Imagine that you had such a watch; you still could not coordinate the opening and closing of the ion channels on one single nerve cell. If you attempted to initiate the millions of operations that occur every moment, a mistake in the timing of just one thousandth of a second would derail the operations.

An Evident Fact

There is another feature that distinguishes neurons from the rest of our cells. Other cells in our bodies are constantly being renewed but neurons do not change. With age, their number decreases but the nerve cells present in a person's old age are the same ones he had in his youth. What has been described to this point has been a really simplified account of communication systems in the neurons that function throughout a person's life. Even someone with intelligence and knowledge would have difficulty understanding these things; cells and hormones have performed these functions very successfully without error in the millions of individuals that have lived in the world since the beginning.

How did these highly complex systems in each one of our nerve cells come into being? How did the incredible harmony among the hundreds of millions of cells in our bodies come into existence? How is such marvelous communication system ensured without confusion arising? How does this system, which depends on remarkably delicate balance and timing, work without making an error?

It is natural that hundreds of questions about "how" fill the human mind. Despite all these facts, some scientists vainly try to defend the evolutionist claim that these flawless systems came to be totally as a result of blind chance. Impossible is not too strong a word to describe the attempts of evolutionists who try to connect the origins of life to an imaginary "primeval cell" formed by chance; they have no answers to the questions posed above.

One point in articles written by evolutionists attracts our attention; there is no scientific explanation of how evolution happens. Instead, they propose that the molecules and proteins that function in communication appear at some stage in so-called evolution, and that they have come down to us with no change in their structure. Certainly, a claim such as this, which has not even the slightest proof, is an immense deceit. In the guise of science, they play a game of words designed to deny creation.

There is no doubt that there is only one explanation why such a marvelous mechanism has come into existence: God, the Lord of all worlds, creates cells from nothing. It is our Lord, the Creator of us all, Who designs the incredibly complex and interconnected communication systems in cells down to their finest details. It is God Who gave never resting atoms, proteins and molecules to our service; and it is only He Who is worthy to be praised and exalted.

A WONDERFUL MESSENGER: NITRIC OXIDE

What do air pollution, a Nobel Prize and a hormone have in common? The answer is "nitric oxide." In chemistry textbooks, nitric oxide is defined as a colorless, poisonous gas that comes into being by the oxygenation of nitrogen. It is a "simple" molecule shown by the chemical formula, "NO" (it is a molecule made up of one nitrogen atom and one oxygen atom). Both nitrogen and oxygen are familiar elements. One of the first things we learn in high school is that the air we breathe is composed of 78% nitrogen and 21% oxygen.

When we say nitric oxide is "simple," we only refer to the simplicity of its chemical composition. With regard to its importance to human life, intense research over the past twenty years has shown that this molecule performs a basic function in communication among cells. The result of scientific work in this field has revealed that nitric oxide is a hormone produced naturally in the human body. It is a chemical messenger that plays a strategic role in the regulation of the vital functioning of the nervous system, circulatory system, immune system, respiratory system and reproductive system.

Poisonous nitric oxide is a gas that causes air pollution and acid rain, destroys the ozone layer and the ecological environment. This gas is produced by the burning of nitrogen and is found in great quantities in car exhaust. Until recently, only this aspect of NO was known. It was believed that, apart from its threat to human health, it had no function. Even the discovery by research that the NO was a hormone was disregarded in scientific circles. Generally, the first reaction to this discovery was disbelief.

But, within a short time, the results of research have awakened great interest in the scientific community; as evidence of this, the December 1992 issue of the well known scientific periodical *Science* called nitric oxide the "molecule of the year."⁷⁴ With increased work in this field of scientific research, nitric oxide has gained great recognition; it has become known as the "magic gas," the "wonderful molecule" and the "secret messenger."

Robert Furchgott, Louis Ignarro and Ferid Murad, who demonstrated the role of nitric oxide in the process of cellular communication, received the 1998 Nobel Prize in Medicine. In the Nobel Foundation press release, it was noted that the prize was awarded to these professors for discoveries made relative to the NO messenger molecule, and it was pointed out that this discovery had elicited an avalanche of research activities in many different laboratories around the world.⁷⁵ Special research in the field of cellular communication has brought several other awards to the same researchers from the Nobel foundation.

In fact, in the last ten years, there has been an explosion in the amount of research done on NO; foundations have been established in the name of Nitric Oxide; periodicals have been published; according to the Nitric Oxide Society records, there are more than 32,000 scientific papers dealing with this remarkable molecule.⁷⁶

Dr. Salvador Monsada, known for his work on nitric oxide, said that NO has changed the generally accepted thinking about cell-to-cell interaction, and that it has turned upside down some ideas about this matter.⁷⁷ Dr. John Cooke, of Stanford University, has characterized this research as "a great discovery" that is going to have "tremendous ramifications in American medicine—in medicine throughout the world."⁷⁸

Of course, the basic point is how these developments have squeezed evolutionists into a corner. As in every scientific advance, new discoveries concerning nitric oxide have created a nightmare for evolutionists because there is no way that the wonderful operations in the human body caused by this molecule, 0.0000000001

meter (one billionth of a meter) in size could be explained in terms of chance. Nitric oxide is one of the numberless signs of God's perfect creation.

Evolutionist circles are relentlessly determined to deny God and blind to every marvelous proof of creation from atoms to galaxies. The attitude of their print media towards NO is that these articles, written with a claim to being scientific, praise nitric oxide immensely and present it like a hero or a superman. Because evolutionists deny the Creator of nitric oxide, they almost divinize this molecule and speak as if it performed all its marvelous operations by its own will and intelligence.

Evolutionists fall into their own trap because, this distorted point of view is no different from divinizing a bee because it gives honey, a tree because it gives fruit, or the sun because it gives light to the world. The same way of thinking would lead one to praise a beautiful painting without mentioning the painter or giving him praise. Every person must choose one of the two roads: either he will believe in God as it says in the Qur'an **"That is God, your Lord. There is no god but Him, the Creator of everything..."** (Qur'an, 6: 102) or he will divinize atoms, molecules, cells and a countless number of animate and inanimate things.

The nitric oxide messenger molecule is only one of the countless blessings that the Almighty God of eternal mercy has created and given to our service. In this century in which we live, it is one of the many wonders of creation that has come to light in the micro-universe. Throughout the section, you will read about the expert design of this molecule that performs its operations on our behalf in a significant number of the 100 trillion (100,000,000,000,000) cells in our bodies.

Design in Our Blood Vessels

Let us begin our investigation of nitric oxide where it was first discovered—the blood vessels. The blood vessels, together with the heart and the blood, form the circulatory system. Our blood vessels are like an immense highway system that goes to every part of our bodies. Its total length is more than 100,000 kilometers. A simple calculation helps us to better understand the importance of this number: if all the arteries, veins, and capillaries in the human body were placed end to end, they could stretch around the earth nearly two and a half times.⁷⁹

And the blood vessel system in our bodies is incomparably more complex than the highway system in a developed country such as America. Highways are built with a particular width and, according to the density of traffic at different times of day, the number of lanes does not increase or decrease. However, the inner diameter of our blood vessels is not fixed; they narrow and dilate according to our activities and thus play an important role in the adjustment of blood pressure. So, thanks to this wonderful system, the changing needs in different areas of our bodies are met automatically. It is because of this flawless system that the blood vessels dilate to respond to an increased need for blood, and constrict after we receive a wound to reduce bleeding.

How do the blood vessels know when to dilate and when to constrict? The answer to this question is very important for human life. It is clear that a slight error that may happen at any point in the 100,000-kilometer long network of blood vessels will ineluctably have negative consequences.

Until ten years ago, scientists suspected that some very complex operations occurred in the blood vessels, but they were unable to answer the questions posed above. Research has revealed the existence of a chemical messenger—the nitric oxide molecule. It is this molecule that gives instructions for the blood vessels to dilate.

Now, let us examine more closely the wonderful installations deep in our blood vessels that produce nitric oxide.

With an electron microscope, the blood vessels appear to be huge in reverse proportion to their smallness. For example, ten capillary vessels arranged side by side are only the size of a human hair. The inner walls of these tiny blood vessels are covered with a tissue that is made up of the smooth muscle cells; the dilation and contraction of the blood vessels happens as a result of the movement of this tissue. The muscle cells do not make direct contact with the blood because a membranous layer exists between the blood and the muscle cells—the endothelium.

By aligning themselves side by side like the links of a chain, endothelium cells form the endothelial layer. Until the 1980's, it was believed that these cells had no function worthy of attention other than facilitating blood flow in the vessels. We now understand that one of the many responsibilities of the endothelium cells is the production of the nitric oxide messenger.

The endothelium cells are factories that produce nitric oxide molecules. These factories in the blood vessels are just one millionth of a meter in size. The chemical products of this microscopic factory, nitric oxide messenger molecules, are also just one millionth of a meter in size. To help us imagine this measurement, the magnification required to see a NO molecule as grape-sized with the naked eye would magnify a tennis ball to the same size as the world.⁸⁰

The Short Life Story of the Messenger NO

Every nitric oxide molecule lasts about 10 seconds. It is designed to communicate its message within this short time to the relevant recipients and do this perfectly without fail. The messenger NO molecules secreted by the endothelium cells are dispersed with great speed in every direction. Those which are directed towards the smooth muscle cells enter the membrane of these cells. The smooth muscle cell membrane acts as a selector giving entry to the NO it recognizes. Without wasting any time, the NO molecule that enters the smooth muscle cells finds a special enzyme called GC and communicates its vitally important message. As a result, a series of complex chemical reactions occur within the cell.

What we have called a messenger is a molecule, 0.000000001 meter in size, containing only two atoms. These tiny molecules act as mail deliverers finding the GC enzyme that is the recipient of the message they carry. There are thousands of different enzymes performing different functions inside cells. Despite this, the message is delivered every time to the right address, that is, to the correct enzyme. Moreover, messenger molecules have a very limited life span, but they never make a mistake in timing. The molecules that carry the messages do not have a compass or similar device to show them the direction, but they never lose their way.

The speed with which the nitric oxide molecule performs its function can be compared to modern communication by e-mail. NO acts just like an electronic postal system, sending many messages at high speed to their destinations.

When GC enzyme in the smooth muscle cells receives the message brought by NO, it begins its activity. The duty of this worker enzyme is to turn the GTP, the energy-carrying molecules, into cGMP. The many reactions that occur between these stages are still unknown.

To put it in most simplest terms, at the end of the activity of the enzymes, the concentration of calcium in the muscle cell diminishes, causing a separation in the fibers and the relaxing of the muscle cells. As a result of this, the vessels dilate. In short, the message carried by the nitric oxide molecule has a vital importance in the adjustment of the pressure in the vessels, and what is explained here is only one of the millions of complex communication operations that go on every moment in our bodies.

How is it that NO molecules that have no intelligence or consciousness know the perfect systems that world-renowned professors can still not fathom? And how is it that they know, to the last second, when they must begin their activity and when they must end it? How is it that, as soon as it is produced, as if it had received a command from somewhere, it is able to deliver high-speed messages to the right address, exactly on time and without fail?

NO cannot perform these wonderful operations by itself. This molecule, like millions of other molecules in nature, is the work of a flawless creation, and it is a demonstration of God's limitless power and knowledge.

The Production Facility For Nitric Oxide: The Endothelial Cell

The amino acid known as Arginine-L, the nitric oxide synthesis, nicotinamide adenine dinucleotide phosphate, calmodulin, oxygen, flavin mononucleotide, flavine-adenine-dinucleotide, tetrahydrobiopterin.

The endothelial cell knows these microscopic materials very well and uses them to produce nitric oxide molecules.

Using modern advanced technology, factories producing chemical products are a trillion times trillion times larger than endothelial cells. In spite of this, the technology of the microscopic factory we call endothelium is much more advanced than that of the giant industrial installations that we are familiar with. The endothelial cell, whose complex operations have been understood only within the last ten years of the twentieth century, accomplish all these without difficulty.

The endothelial cell knows what chemical material must be used and in what proportion to produce the NO molecule. There is no error in production. For example, N_2O (laughing gas) is not produced instead of NO. The production within the endothelial cell never relies on chance; the balances in the production are very delicate. At this point, recall that if the endothelial cell produced fewer messengers than required, our blood vessels would constrict, and our blood pressure would rise quickly, causing a heart attack. If too much is produced, our blood vessels would dilate excessively, our blood pressure would fall too low, and we would go into shock. But endothelial cells never make such mistakes that could cause our deaths.

These cells are ready to produce NO at every moment of our lives; when the need arises, the production goes into action immediately. This tiny factory works very efficiently; it does not store the NO molecules it produces, so that problems associated with storage do not arise.

This remarkable factory in the depths of our blood vessels does not produce unwanted by-products. If we consider that global warming, acid rain, environmental pollution and many other problems facing the world today come from chemical waste, we can better understand how efficient endothelial cells are. The nitric oxide molecules do their job in only ten seconds and afterwards disintegrate so that no dangerous side effects occur

from their accumulation in the body. All this means that endothelial cells use the ideal method in the production of chemical products.

An industrial factory is the work of engineers and workers. The systems in this factory show the highly advanced technology of their designers. The endothelium factory is the work of a superior Creator; this microscopic factory, together with the other 100 trillion cells in our body, clearly demonstrate the eternal knowledge of God.

The Messenger in Sperm

Another very important function performed on our behalf by this molecule occurs in the first moment of our lives. First, we must notice when we say "the first moment of our lives," we do not mean the moment we were born. The first moment of our lives is the first moment of the one cell that formed us, when the sperm united with the egg.

When the sperm and the egg meet, a number of incredibly complex chemical operations begin, and as a result, an embryo is formed. But, among the many details that are still unknown, there is an important point that can be summarized in the words of Professor David Epel who said, "Since the turn of the century, people have wondered exactly how sperm-egg contact initiates development."⁸¹

The research carried out to find the answer to this question has shown that the messenger carried by NO initiates the wonderful process in the mother's womb. Inside the sperm there is an enzyme called Nitric Oxide Synthase (NOS). This enzyme begins to produce NO a few seconds before fertilization with perfect timing. When union occurs, the nitric oxide molecules in the sperm are dispersed within the egg; thirty seconds later, the calcium in the egg is activated and, the multiplication mechanism in the first cell goes into operation. The wonderful organization within this first cell is not yet fully understood. It is interesting for us to notice that, if there were an insufficiency in the nitric oxide molecule, communication between the sperm and the egg would not be established. Science came to understand this fact only in the year 2000; this shows us again that nitric oxide was created by God and appointed by Him to perform its functions.

Face to Face With Bacteria and Viruses

Earlier we mentioned that, although nitric oxide carries vital messages, it is also a poisonous molecule. So, the role of NO in the immune system is related to its poisonous qualities. This molecule is secreted by macrophages, which are important in the body's immune system. Recall that macrophages are microorganisms 0.01 of a millimeter in size. By a process called phagocytosis, they remove (swallow) bacteria and molecules, which are dangerous for our bodies. When a macrophage meets germs or bacteria that cause sickness, it surrounds them; afterwards, the bacteria that are embraced on every side by the macrophages are subjected to a bombardment of nitric oxide. In this way, nitric oxide molecules start a reaction to destroy the bacteria. Certainly, the cooperation between nitric oxide and macrophages is one of the countless proofs of the harmonious creation.

The NO molecules have another interesting role in the immune system. Research has shown that NO renders the "protease" enzyme found in some viruses ineffective. This enzyme breaks down big proteins into

small parts that are used in the production of new viruses. NO puts this enzyme out of operation, preventing the virus from multiplying.

Tiny molecules find other molecules in a body that they have never before encountered and know very well how to neutralize their effects. In this way, people can be rescued from great dangers that they were not even aware of. It is very clear that all this order and connection among molecules cannot be the result of chance. God, the Lord of the universe, has given the NO molecules their function and created them with their special qualities.

Research in this field continues, and it is thought that, in the near future, scientists will be able to use nitric oxide in the fight against cancer. Each new bit of information that comes to light will show once again that this molecule is a product of extraordinary design.

Every day, the nitric oxide molecule is subject of new research, and the results of this research amaze even scientists. What is known at this point is that this messenger molecule is produced in various cells throughout our whole body, and that it has important functions in many bodily operations. In order to understand how utterly astonishing the activities of this molecule are, put yourself for a moment in the place of NO and imagine that you are undertaking its duties.

1. First, imagine that you must take over the role of this molecule in adjusting the blood vessels. In order to do this successfully, you must first know the circulatory system and its components—heart, blood and blood vessels—very well.

2. In the course of various daily activities such as sleeping, eating and playing sports, you will need to communicate messages about the adjustment of blood pressure to the relevant organs. In doing this, you cannot overlook anything or make the slightest error. Otherwise, the blood pressure would fall lower or rise higher than normal, opening the way for a stroke, shock, heart attack and other conditions that could result in death. Moreover, remember that the veins, arteries, and capillaries in our bodies have a total length of more than 100 thousand kilometers. Given this, you can safely guess that you could not possibly perform this duty.

3. It is known that NO is used as a messenger in our brain during the process of learning. These operations are so complex that a large part of them is still not understood. Therefore, the concerted efforts of the whole scientific world could not possibly accomplish this messenger function, let alone you, a single individual.

4. Do not forget the part played by nitric oxide in the successful fight by the immune system against viruses and bacteria.

5. Moreover, in this section we have not touched on the role of the messenger in the functioning of the lungs, liver, kidneys, stomach and the reproductive system. When you take the place of NO in a human body, you must understand the language of all these organs; you must be an expert in them all. Of course, this is not enough because there is nothing that can be compared to the human body with all its organs working in harmony and all its trillions of cells performing incredibly complex functions.

6. Finally, you must keep in mind that, if this messenger is not used in the right proportion, with the right timing and in just the right place, harmful and dangerous results could occur. This could be compared to a person who has done very complicated processes with dynamite or some other explosive substance every moment for 60-70 years and who has not miscalculated by even one second in the complex operations he has performed.

No matter how much of an expert you are, you must confess that you would not be able to do what this molecule does, even with the help of the most advanced computers and laboratories.

Certainly, the nitric oxide messenger molecule has been created by God Who has "**created everything and determined it most exactly...**" (Qur'an, 25: 2) Although this molecule has no sense organs, intelligence, consciousness, education or technical training, the fact that it can regulate the operations of cells, make and carry out on its own initiative delicate and necessary decisions relative to the human body, comes from God's superior and incomparable design.

All this information has been obtained during the last decade of the twentieth century as a result of intense research by scientists who are considered authorities in this field. Certainly, all the things unknown about NO cannot be brought to light just by the work of individual researchers; there are other factors that must be considered. States and international foundations have spent enormous amounts of money on scientific work in this field and have established laboratories with tools that are the product of the latest technology.

Certainly, the fact that the wonders of creation contained in this messenger molecule have been discovered only after so much work and effort is another demonstration of the superior knowledge of God.

CONCLUSION

Throughout this book we have learned how 100 trillion cells are individually controlled and directed by tiny, unconscious molecules, and we have seen how these molecules we call hormones establish their control over cells. We have examined the communication network among cells and we have seen how two cells, far distant from each other and without eyes or ears, can communicate with each other. And we have seen that the wonders operating deep in the human body are striking examples of God's creative artistry.

As you examined the intricacies of these wonders, the miraculous operations you were reading about continued to occur in the depths of your body. Throughout the time while you were reading this book, unconscious cells in your body were demonstrating their highly intelligent behavior.

For example, some cells measured the amount of fluid in your blood.

Other cells measured the amount of sugar in your blood numerous times, and thousands of your cells worked independently to balance that amount.

Some cells ensured that your bones mixed the proper amount calcium into your blood. In some cases, a contrary operation took place, and the excess calcium in your blood was returned to the bones.

New skin cells were constructed to replace dying ones. To do this, some cells were caused to divide and multiply. In order to adjust your body temperature, trillions of cells functioned as micro-heaters. The speed at which each cell functioned was supervised and controlled individually.

Cells determined the amount of sodium in your blood, and the required amount was supplied by special mechanisms.

Cells measured your blood pressure to prevent it from rising or falling to a dangerous level and worked day and night to take the appropriate adjustment measures.

The muscle cells around your blood vessels sometimes contracted to narrow them and sometimes relaxed to dilate them.

Some cells in your kidneys took either fluid or sodium molecules from the urine and mixed them with your blood...

And thousands of operations like these were carried out by means of your hormones.

In short, in order to allow you to survive, every point in your body was controlled individually, deficiencies were removed, and order was ensured. As you read this book about hormones, hormone molecules ensured the operation of all these wonderful functions in your body.

At this point, there is an important duty that becomes incumbent on a person: the duty to think.

Everything in the heavens and on Earth is a proof of the existence of God, and thinking is the only way to see these proofs properly.

Thinking about created things draws us closer to God and enables us to better appreciate His power, and thinking is the vehicle by which our awareness of God is increased. The Qur'an reveals that the wonders of God are found on Earth and in the heavens and describes the attitude of faithful people to these wonders.

In the creation of the heavens and the Earth, and the alternation of night and day, there are Signs for people with intelligence: those who remember God, standing, sitting and lying on their sides, and reflect on the creation of the heavens and the Earth [saying]: "Our Lord, You have not created

this for nothing. Glory be to You! So safeguard us from the punishment of the Fire." (Qur'an, 3: 190-191)

The hormone system that operates in the depths of a person's body without his knowing it is a demonstration of God's marvelous signs. For this reason, it would certainly be a great mistake to look at the topics treated in this book only from a biological point of view.

Thinking about the wonders happening in our own bodies, reflecting on how they all occur and how the existing systems came to be will draw us closer to God.

There is another important conclusion to be drawn from studying the hormone system: thinking about this system will make a person more conscious of the unjust fabrications against the existence of God by the theory of evolution that denies His existence. The hormone system is an integrated whole made up of sub-systems; if one part of it does not function, the entire system will fail. It is clear from this that the claim of the evolutionists that this system came to be by chance is a fairy tale.

The person who reads this book has another duty: to do all he can to share with other people the wonders of creation he has come to understand and to tell everyone around him, sincerely, enthusiastically and from the heart, about the artistry that God has displayed. Only in this way will this book attain its purpose: to communicate to as many people as possible the intricacies of God's creative artistry.

THE DECEPTION OF EVOLUTION

Darwinism, in other words the theory of evolution, was put forward with the aim of denying the fact of creation, but is in truth nothing but failed, unscientific nonsense. This theory, which claims that life emerged by chance from inanimate matter, was invalidated by the scientific evidence of clear "design" in the universe and in living things. In this way, science confirmed the fact that God created the universe and the living things in it. The propaganda carried out today in order to keep the theory of evolution alive is based solely on the distortion of the scientific facts, biased interpretation, and lies and falsehoods disguised as science.

Yet this propaganda cannot conceal the truth. The fact that the theory of evolution is the greatest deception in the history of science has been expressed more and more in the scientific world over the last 20-30 years. Research carried out after the 1980s in particular has revealed that the claims of Darwinism are totally unfounded, something that has been stated by a large number of scientists. In the United States in particular, many scientists from such different fields as biology, biochemistry and paleontology recognize the invalidity of Darwinism and employ the concept of intelligent design to account for the origin of life. This "intelligent design" is a scientific expression of the fact that God created all living things.

We have examined the collapse of the theory of evolution and the proofs of creation in great scientific detail in many of our works, and are still continuing to do so. Given the enormous importance of this subject, it will be of great benefit to summarize it here.

The Scientific Collapse of Darwinism

Although this doctrine goes back as far as ancient Greece, the theory of evolution was advanced extensively in the nineteenth century. The most important development that made it the top topic of the world of science was Charles Darwin's *The Origin of Species*, published in 1859. In this book, he denied that God created different living species on Earth separately, for he claimed that all living beings had a common ancestor and had diversified over time through small changes. Darwin's theory was not based on any concrete scientific finding; as he also accepted, it was just an "assumption." Moreover, as Darwin confessed in the long chapter of his book titled "Difficulties of the Theory," the theory failed in the face of many critical questions.

Darwin invested all of his hopes in new scientific discoveries, which he expected to solve these difficulties. However, contrary to his expectations, scientific findings expanded the dimensions of these difficulties. The defeat of Darwinism in the face of science can be reviewed under three basic topics:

- 1) The theory cannot explain how life originated on Earth.
 - 2) No scientific finding shows that the "evolutionary mechanisms" proposed by the theory have any evolutionary power at all.
 - 3) The fossil record proves the exact opposite of what the theory suggests.
- In this section, we will examine these three basic points in general outlines:

The First Insurmountable Step: The Origin of Life

The theory of evolution posits that all living species evolved from a single living cell that emerged on the primitive Earth 3.8 billion years ago. How a single cell could generate millions of complex living species and, if such an evolution really occurred, why traces of it cannot be observed in the fossil record are some of the questions that the theory cannot answer. However, first and foremost, we need to ask: How did this "first cell" originate?

Since the theory of evolution denies creation and any kind of supernatural intervention, it maintains that the "first cell" originated coincidentally within the laws of nature, without any design, plan or arrangement. According to the theory, inanimate matter must have produced a living cell as a result of coincidences. Such a claim, however, is inconsistent with the most unassailable rules of biology.

"Life Comes from Life"

In his book, Darwin never referred to the origin of life. The primitive understanding of science in his time rested on the assumption that living beings had a very simple structure. Since medieval times, spontaneous generation, which asserts that non-living materials came together to form living organisms, had been widely accepted. It was commonly believed that insects came into being from food leftovers, and mice from wheat. Interesting experiments were conducted to prove this theory. Some wheat was placed on a dirty piece of cloth, and it was believed that mice would originate from it after a while.

Similarly, maggots developing in rotting meat was assumed to be evidence of spontaneous generation. However, it was later understood that worms did not appear on meat spontaneously, but were carried there by flies in the form of larvae, invisible to the naked eye.

Even when Darwin wrote *The Origin of Species*, the belief that bacteria could come into existence from non-living matter was widely accepted in the world of science.

However, five years after the publication of Darwin's book, Louis Pasteur announced his results after long studies and experiments, that disproved spontaneous generation, a cornerstone of Darwin's theory. In his triumphal lecture at the Sorbonne in 1864, Pasteur said: "Never will the doctrine of spontaneous generation recover from the mortal blow struck by this simple experiment."⁸²

For a long time, advocates of the theory of evolution resisted these findings. However, as the development of science unraveled the complex structure of the cell of a living being, the idea that life could come into being coincidentally faced an even greater impasse.

Inconclusive Efforts in the Twentieth Century

The first evolutionist who took up the subject of the origin of life in the twentieth century was the renowned Russian biologist Alexander Oparin. With various theses he advanced in the 1930s, he tried to prove

that a living cell could originate by coincidence. These studies, however, were doomed to failure, and Oparin had to make the following confession:

Unfortunately, however, the problem of the origin of the cell is perhaps the most obscure point in the whole study of the evolution of organisms.⁸³

Evolutionist followers of Oparin tried to carry out experiments to solve this problem. The best known experiment was carried out by the American chemist Stanley Miller in 1953. Combining the gases he alleged to have existed in the primordial Earth's atmosphere in an experiment set-up, and adding energy to the mixture, Miller synthesized several organic molecules (amino acids) present in the structure of proteins.

Barely a few years had passed before it was revealed that this experiment, which was then presented as an important step in the name of evolution, was invalid, for the atmosphere used in the experiment was very different from the real Earth conditions.⁸⁴

After a long silence, Miller confessed that the atmosphere medium he used was unrealistic.⁸⁵

All the evolutionists' efforts throughout the twentieth century to explain the origin of life ended in failure. The geochemist Jeffrey Bada, from the San Diego Scripps Institute accepts this fact in an article published in *Earth* magazine in 1998:

Today as we leave the twentieth century, we still face the biggest unsolved problem that we had when we entered the twentieth century: How did life originate on Earth?⁸⁶

The Complex Structure of Life

The primary reason why the theory of evolution ended up in such a great impasse regarding the origin of life is that even those living organisms deemed to be the simplest have incredibly complex structures. The cell of a living thing is more complex than all of our man-made technological products. Today, even in the most developed laboratories of the world, a living cell cannot be produced by bringing organic chemicals together.

The conditions required for the formation of a cell are too great in quantity to be explained away by coincidences. The probability of proteins, the building blocks of a cell, being synthesized coincidentally, is 1 in 10^{950} for an average protein made up of 500 amino acids. In mathematics, a probability smaller than 1 over 10^{50} is considered to be impossible in practical terms.

The DNA molecule, which is located in the nucleus of a cell and which stores genetic information, is an incredible databank. If the information coded in DNA were written down, it would make a giant library consisting of an estimated 900 volumes of encyclopedias consisting of 500 pages each.

A very interesting dilemma emerges at this point: DNA can replicate itself only with the help of some specialized proteins (enzymes). However, the synthesis of these enzymes can be realized only by the information coded in DNA. As they both depend on each other, they have to exist at the same time for replication. This brings the scenario that life originated by itself to a deadlock. Prof. Leslie Orgel, an evolutionist of repute from the University of San Diego, California, confesses this fact in the September 1994 issue of the *Scientific American* magazine:

It is extremely improbable that proteins and nucleic acids, both of which are structurally complex, arose spontaneously in the same place at the same time. Yet it also seems impossible to have one without the other.

And so, at first glance, one might have to conclude that life could never, in fact, have originated by chemical means.⁸⁷

No doubt, if it is impossible for life to have originated from natural causes, then it has to be accepted that life was "created" in a supernatural way. This fact explicitly invalidates the theory of evolution, whose main purpose is to deny creation.

Imaginary Mechanisms of Evolution

The second important point that negates Darwin's theory is that both concepts put forward by the theory as "evolutionary mechanisms" were understood to have, in reality, no evolutionary power.

Darwin based his evolution allegation entirely on the mechanism of "natural selection." The importance he placed on this mechanism was evident in the name of his book: *The Origin of Species, By Means of Natural Selection*...

Natural selection holds that those living things that are stronger and more suited to the natural conditions of their habitats will survive in the struggle for life. For example, in a deer herd under the threat of attack by wild animals, those that can run faster will survive. Therefore, the deer herd will be comprised of faster and stronger individuals. However, unquestionably, this mechanism will not cause deer to evolve and transform themselves into another living species, for instance, horses.

Therefore, the mechanism of natural selection has no evolutionary power. Darwin was also aware of this fact and had to state this in his book *The Origin of Species*:

Natural selection can do nothing until favourable individual differences or variations occur.⁸⁸

Lamarck's Impact

So, how could these "favorable variations" occur? Darwin tried to answer this question from the standpoint of the primitive understanding of science at that time. According to the French biologist Chevalier de Lamarck (1744-1829), who lived before Darwin, living creatures passed on the traits they acquired during their lifetime to the next generation. He asserted that these traits, which accumulated from one generation to another, caused new species to be formed. For instance, he claimed that giraffes evolved from antelopes; as they struggled to eat the leaves of high trees, their necks were extended from generation to generation.

Darwin also gave similar examples. In his book *The Origin of Species*, for instance, he said that some bears going into water to find food transformed themselves into whales over time.⁸⁹

However, the laws of inheritance discovered by Gregor Mendel (1822-84) and verified by the science of genetics, which flourished in the twentieth century, utterly demolished the legend that acquired traits were passed on to subsequent generations. Thus, natural selection fell out of favor as an evolutionary mechanism.

Neo-Darwinism and Mutations

In order to find a solution, Darwinists advanced the "Modern Synthetic Theory," or as it is more commonly known, Neo-Darwinism, at the end of the 1930's. Neo-Darwinism added mutations, which are distortions formed in the genes of living beings due to such external factors as radiation or replication errors, as the "cause of favorable variations" in addition to natural mutation.

Today, the model that stands for evolution in the world is Neo-Darwinism. The theory maintains that millions of living beings formed as a result of a process whereby numerous complex organs of these organisms (e.g., ears, eyes, lungs, and wings) underwent "mutations," that is, genetic disorders. Yet, there is an outright scientific fact that totally undermines this theory: Mutations do not cause living beings to develop; on the contrary, they are always harmful.

The reason for this is very simple: DNA has a very complex structure, and random effects can only harm it. The American geneticist B.G. Ranganathan explains this as follows:

First, genuine mutations are very rare in nature. Secondly, most mutations are harmful since they are random, rather than orderly changes in the structure of genes; any random change in a highly ordered system will be for the worse, not for the better. For example, if an earthquake were to shake a highly ordered structure such as a building, there would be a random change in the framework of the building which, in all probability, would not be an improvement.⁹⁰

Not surprisingly, no mutation example, which is useful, that is, which is observed to develop the genetic code, has been observed so far. All mutations have proved to be harmful. It was understood that mutation, which is presented as an "evolutionary mechanism," is actually a genetic occurrence that harms living things, and leaves them disabled. (The most common effect of mutation on human beings is cancer.) Of course, a destructive mechanism cannot be an "evolutionary mechanism." Natural selection, on the other hand, "can do nothing by itself," as Darwin also accepted. This fact shows us that there is no "evolutionary mechanism" in nature. Since no evolutionary mechanism exists, no such any imaginary process called "evolution" could have taken place.

The Fossil Record: No Sign of Intermediate Forms

The clearest evidence that the scenario suggested by the theory of evolution did not take place is the fossil record.

According to this theory, every living species has sprung from a predecessor. A previously existing species turned into something else over time and all species have come into being in this way. In other words, this transformation proceeds gradually over millions of years.

Had this been the case, numerous intermediary species should have existed and lived within this long transformation period.

For instance, some half-fish/half-reptiles should have lived in the past which had acquired some reptilian traits in addition to the fish traits they already had. Or there should have existed some reptile-birds, which acquired some bird traits in addition to the reptilian traits they already had. Since these would be in a transitional phase, they should be disabled, defective, crippled living beings. Evolutionists refer to these imaginary creatures, which they believe to have lived in the past, as "transitional forms."

If such animals ever really existed, there should be millions and even billions of them in number and variety. More importantly, the remains of these strange creatures should be present in the fossil record. In *The Origin of Species*, Darwin explained:

If my theory be true, numberless intermediate varieties, linking most closely all of the species of the same group together must assuredly have existed... Consequently, evidence of their former existence could be found only amongst fossil remains.⁹¹

Darwin's Hopes Shattered

However, although evolutionists have been making strenuous efforts to find fossils since the middle of the nineteenth century all over the world, no transitional forms have yet been uncovered. All of the fossils, contrary to the evolutionists' expectations, show that life appeared on Earth all of a sudden and fully-formed.

One famous British paleontologist, Derek V. Ager, admits this fact, even though he is an evolutionist:

The point emerges that if we examine the fossil record in detail, whether at the level of orders or of species, we find – over and over again – not gradual evolution, but the sudden explosion of one group at the expense of another.⁹²

This means that in the fossil record, all living species suddenly emerge as fully formed, without any intermediate forms in between. This is just the opposite of Darwin's assumptions. Also, this is very strong evidence that all living things are created. The only explanation of a living species emerging suddenly and complete in every detail without any evolutionary ancestor is that it was created. This fact is admitted also by the widely known evolutionist biologist Douglas Futuyma:

Creation and evolution, between them, exhaust the possible explanations for the origin of living things. Organisms either appeared on the earth fully developed or they did not. If they did not, they must have developed from pre-existing species by some process of modification. If they did appear in a fully developed state, they must indeed have been created by some omnipotent intelligence.⁹³

Fossils show that living beings emerged fully developed and in a perfect state on the Earth. That means that "the origin of species," contrary to Darwin's supposition, is not evolution, but creation.

The Tale of Human Evolution

The subject most often brought up by advocates of the theory of evolution is the subject of the origin of man. The Darwinist claim holds that modern man evolved from ape-like creatures. During this alleged evolutionary process, which is supposed to have started 4-5 million years ago, some "transitional forms" between modern man and his ancestors are supposed to have existed. According to this completely imaginary scenario, four basic "categories" are listed:

1. Australopithecus
2. Homo habilis
3. Homo erectus

4. Homo sapiens

Evolutionists call man's so-called first ape-like ancestors *Australopithecus*, which means "South African ape." These living beings are actually nothing but an old ape species that has become extinct. Extensive research done on various *Australopithecus* specimens by two world famous anatomists from England and the USA, namely, Lord Solly Zuckerman and Prof. Charles Oxnard, shows that these apes belonged to an ordinary ape species that became extinct and bore no resemblance to humans.⁹⁴

Evolutionists classify the next stage of human evolution as "*homo*," that is "man." According to their claim, the living beings in the *Homo* series are more developed than *Australopithecus*. Evolutionists devise a fanciful evolution scheme by arranging different fossils of these creatures in a particular order. This scheme is imaginary because it has never been proved that there is an evolutionary relation between these different classes. Ernst Mayr, one of the twentieth century's most important evolutionists, contends in his book *One Long Argument* that "particularly historical [puzzles] such as the origin of life or of *Homo sapiens*, are extremely difficult and may even resist a final, satisfying explanation."⁹⁵

By outlining the link chain as *Australopithecus* > *Homo habilis* > *Homo erectus* > *Homo sapiens*, evolutionists imply that each of these species is one another's ancestor. However, recent findings of paleoanthropologists have revealed that *Australopithecus*, *Homo habilis*, and *Homo erectus* lived at different parts of the world at the same time.⁹⁶

Moreover, a certain segment of humans classified as *Homo erectus* have lived up until very modern times. *Homo sapiens neandarthalsensis* and *Homo sapiens sapiens* (modern man) co-existed in the same region.⁹⁷

This situation apparently indicates the invalidity of the claim that they are ancestors of one another. A paleontologist from Harvard University, Stephen Jay Gould, explains this deadlock of the theory of evolution, although he is an evolutionist himself:

What has become of our ladder if there are three coexisting lineages of hominids (*A. africanus*, the robust australopithecines, and *H. habilis*), none clearly derived from another? Moreover, none of the three display any evolutionary trends during their tenure on earth.⁹⁸

Put briefly, the scenario of human evolution, which is "upheld" with the help of various drawings of some "half ape, half human" creatures appearing in the media and course books, that is, frankly, by means of propaganda, is nothing but a tale with no scientific foundation.

Lord Solly Zuckerman, one of the most famous and respected scientists in the U.K., who carried out research on this subject for years and studied *Australopithecus* fossils for 15 years, finally concluded, despite being an evolutionist himself, that there is, in fact, no such family tree branching out from ape-like creatures to man.

Zuckerman also made an interesting "spectrum of science" ranging from those he considered scientific to those he considered unscientific. According to Zuckerman's spectrum, the most "scientific"-that is, depending on concrete data-fields of science are chemistry and physics. After them come the biological sciences and then the social sciences. At the far end of the spectrum, which is the part considered to be most "unscientific," are "extra-sensory perception"-concepts such as telepathy and sixth sense-and finally "human evolution." Zuckerman explains his reasoning:

We then move right off the register of objective truth into those fields of presumed biological science, like extrasensory perception or the interpretation of man's fossil history, where to the faithful [evolutionist] anything is

possible – and where the ardent believer [in evolution] is sometimes able to believe several contradictory things at the same time.⁹⁹

The tale of human evolution boils down to nothing but the prejudiced interpretations of some fossils unearthed by certain people, who blindly adhere to their theory.

Technology in the Eye and the Ear

Another subject that remains unanswered by evolutionary theory is the excellent quality of perception in the eye and the ear.

Before passing on to the subject of the eye, let us briefly answer the question of how we see. Light rays coming from an object fall oppositely on the eye's retina. Here, these light rays are transmitted into electric signals by cells and reach a tiny spot at the back of the brain, the "center of vision." These electric signals are perceived in this center as an image after a series of processes. With this technical background, let us do some thinking.

The brain is insulated from light. That means that its inside is completely dark, and that no light reaches the place where it is located. Thus, the "center of vision" is never touched by light and may even be the darkest place you have ever known. However, you observe a luminous, bright world in this pitch darkness.

The image formed in the eye is so sharp and distinct that even the technology of the twentieth century has not been able to attain it. For instance, look at the book you are reading, your hands with which you are holding it, and then lift your head and look around you. Have you ever seen such a sharp and distinct image as this one at any other place? Even the most developed television screen produced by the greatest television producer in the world cannot provide such a sharp image for you. This is a three-dimensional, colored, and extremely sharp image. For more than 100 years, thousands of engineers have been trying to achieve this sharpness. Factories, huge premises were established, much research has been done, plans and designs have been made for this purpose. Again, look at a TV screen and the book you hold in your hands. You will see that there is a big difference in sharpness and distinction. Moreover, the TV screen shows you a two-dimensional image, whereas with your eyes, you watch a three-dimensional perspective with depth.

For many years, tens of thousands of engineers have tried to make a three-dimensional TV and achieve the vision quality of the eye. Yes, they have made a three-dimensional television system, but it is not possible to watch it without putting on special 3-D glasses; moreover, it is only an artificial three-dimension. The background is more blurred, the foreground appears like a paper setting. Never has it been possible to produce a sharp and distinct vision like that of the eye. In both the camera and the television, there is a loss of image quality.

Evolutionists claim that the mechanism producing this sharp and distinct image has been formed by chance. Now, if somebody told you that the television in your room was formed as a result of chance, that all of its atoms just happened to come together and make up this device that produces an image, what would you think? How can atoms do what thousands of people cannot?

If a device producing a more primitive image than the eye could not have been formed by chance, then it is very evident that the eye and the image seen by the eye could not have been formed by chance. The same situation applies to the ear. The outer ear picks up the available sounds by the auricle and directs them to the middle ear, the middle ear transmits the sound vibrations by intensifying them, and the inner ear sends these

vibrations to the brain by translating them into electric signals. Just as with the eye, the act of hearing finalizes in the center of hearing in the brain.

The situation in the eye is also true for the ear. That is, the brain is insulated from sound just as it is from light. It does not let any sound in. Therefore, no matter how noisy is the outside, the inside of the brain is completely silent. Nevertheless, the sharpest sounds are perceived in the brain. In your completely silent brain, you listen to symphonies, and hear all of the noises in a crowded place. However, were the sound level in your brain was measured by a precise device at that moment, complete silence would be found to be prevailing there.

As is the case with imagery, decades of effort have been spent in trying to generate and reproduce sound that is faithful to the original. The results of these efforts are sound recorders, high-fidelity systems, and systems for sensing sound. Despite all of this technology and the thousands of engineers and experts who have been working on this endeavor, no sound has yet been obtained that has the same sharpness and clarity as the sound perceived by the ear. Think of the highest-quality hi-fi systems produced by the largest company in the music industry. Even in these devices, when sound is recorded some of it is lost; or when you turn on a hi-fi you always hear a hissing sound before the music starts. However, the sounds that are the products of the human body's technology are extremely sharp and clear. A human ear never perceives a sound accompanied by a hissing sound or with atmospherics as does a hi-fi; rather, it perceives sound exactly as it is, sharp and clear. This is the way it has been since the creation of man.

So far, no man-made visual or recording apparatus has been as sensitive and successful in perceiving sensory data as are the eye and the ear. However, as far as seeing and hearing are concerned, a far greater truth lies beyond all this.

To Whom Does the Consciousness That Sees and Hears Within the Brain Belong?

Who watches an alluring world in the brain, listens to symphonies and the twittering of birds, and smells the rose?

The stimulations coming from a person's eyes, ears, and nose travel to the brain as electro-chemical nerve impulses. In biology, physiology, and biochemistry books, you can find many details about how this image forms in the brain. However, you will never come across the most important fact: Who perceives these electro-chemical nerve impulses as images, sounds, odors, and sensory events in the brain? There is a consciousness in the brain that perceives all this without feeling any need for an eye, an ear, and a nose. To whom does this consciousness belong? Of course it does not belong to the nerves, the fat layer, and neurons comprising the brain. This is why Darwinist-materialists, who believe that everything is comprised of matter, cannot answer these questions.

For this consciousness is the spirit created by God, which needs neither the eye to watch the images nor the ear to hear the sounds. Furthermore, it does not need the brain to think.

Everyone who reads this explicit and scientific fact should ponder on Almighty God, and fear and seek refuge in Him, for He squeezes the entire universe in a pitch-dark place of a few cubic centimeters in a three-dimensional, colored, shadowy, and luminous form.

A Materialist Faith

The information we have presented so far shows us that the theory of evolution is incompatible with scientific findings. The theory's claim regarding the origin of life is inconsistent with science, the evolutionary mechanisms it proposes have no evolutionary power, and fossils demonstrate that the required intermediate forms have never existed. So, it certainly follows that the theory of evolution should be pushed aside as an unscientific idea. This is how many ideas, such as the Earth-centered universe model, have been taken out of the agenda of science throughout history.

However, the theory of evolution is kept on the agenda of science. Some people even try to represent criticisms directed against it as an "attack on science." Why?

The reason is that this theory is an indispensable dogmatic belief for some circles. These circles are blindly devoted to materialist philosophy and adopt Darwinism because it is the only materialist explanation that can be put forward to explain the workings of nature.

Interestingly enough, they also confess this fact from time to time. A well-known geneticist and an outspoken evolutionist, Richard C. Lewontin from Harvard University, confesses that he is "first and foremost a materialist and then a scientist":

It is not that the methods and institutions of science somehow compel us accept a material explanation of the phenomenal world, but, on the contrary, that we are forced by our a priori adherence to material causes to create an apparatus of investigation and a set of concepts that produce material explanations, no matter how counter-intuitive, no matter how mystifying to the uninitiated. Moreover, that materialism is absolute, so we cannot allow a Divine Foot in the door.¹⁰⁰

These are explicit statements that Darwinism is a dogma kept alive just for the sake of adherence to materialism. This dogma maintains that there is no being save matter. Therefore, it argues that inanimate, unconscious matter created life. It insists that millions of different living species (e.g., birds, fish, giraffes, tigers, insects, trees, flowers, whales, and human beings) originated as a result of the interactions between matter such as pouring rain, lightning flashes, and so on, out of inanimate matter. This is a precept contrary both to reason and science. Yet Darwinists continue to defend it just so as "not to allow a Divine Foot in the door."

Anyone who does not look at the origin of living beings with a materialist prejudice will see this evident truth: All living beings are works of a Creator, Who is All-Powerful, All-Wise, and All-Knowing. This Creator is God, Who created the whole universe from non-existence, designed it in the most perfect form, and fashioned all living beings.

The Theory of Evolution is the Most Potent Spell in the World

Anyone free of prejudice and the influence of any particular ideology, who uses only his or her reason and logic, will clearly understand that belief in the theory of evolution, which brings to mind the superstitions of societies with no knowledge of science or civilization, is quite impossible.

As explained above, those who believe in the theory of evolution think that a few atoms and molecules thrown into a huge vat could produce thinking, reasoning professors and university students; such scientists as Einstein and Galileo; such artists as Humphrey Bogart, Frank Sinatra and Luciano Pavarotti; as well as antelopes, lemon trees, and carnations. Moreover, as the scientists and professors who believe in this nonsense are

educated people, it is quite justifiable to speak of this theory as "the most potent spell in history." Never before has any other belief or idea so taken away peoples' powers of reason, refused to allow them to think intelligently and logically and hidden the truth from them as if they had been blindfolded. This is an even worse and unbelievable blindness than the Egyptians worshipping the Sun God Ra, totem worship in some parts of Africa, the people of Saba worshipping the Sun, the tribe of Prophet Abraham (peace be upon him) worshipping idols they had made with their own hands, or the people of the Prophet Moses (peace be upon him) worshipping the Golden Calf.

In fact, God has pointed to this lack of reason in the Qur'an. In many verse, He reveals in many verses that some peoples' minds will be closed and that they will be powerless to see the truth. Some of these verses are as follows:

As for those who do not believe, it makes no difference to them whether you warn them or do not warn them, they will not believe. God has sealed up their hearts and hearing and over their eyes is a blindfold. They will have a terrible punishment. (Qur'an, 2: 6-7)

... They have hearts with which they do not understand. They have eyes with which they do not see. They have ears with which they do not hear. Such people are like cattle. No, they are even further astray! They are the unaware. (Qur'an, 7: 179)

Even if We opened up to them a door into heaven, and they spent the day ascending through it, they would only say: "Our eyesight is befuddled! Or rather we have been put under a spell!" (Qur'an, 15: 14-15)

Words cannot express just how astonishing it is that this spell should hold such a wide community in thrall, keep people from the truth, and not be broken for 150 years. It is understandable that one or a few people might believe in impossible scenarios and claims full of stupidity and illogicality. However, "magic" is the only possible explanation for people from all over the world believing that unconscious and lifeless atoms suddenly decided to come together and form a universe that functions with a flawless system of organization, discipline, reason, and consciousness; a planet named Earth with all of its features so perfectly suited to life; and living things full of countless complex systems.

In fact, the Qur'an relates the incident of Prophet Moses and Pharaoh to show that some people who support atheistic philosophies actually influence others by magic. When Pharaoh was told about the true religion, he told Prophet Moses to meet with his own magicians. When Moses did so, he told them to demonstrate their abilities first. The verses continue:

He said: "You throw." And when they threw, they cast a spell on the people's eyes and caused them to feel great fear of them. They produced an extremely powerful magic. (Qur'an, 7: 116)

As we have seen, Pharaoh's magicians were able to deceive everyone, apart from Moses and those who believed in him. However, his evidence broke the spell, or "swallowed up what they had forged," as the verse puts it.

We revealed to Moses, "Throw down your staff." And it immediately swallowed up what they had forged. So the Truth took place and what they did was shown to be false. (Qur'an, 7: 117-119)

As we can see, when people realized that a spell had been cast upon them and that what they saw was just an illusion, Pharaoh's magicians lost all credibility. In the present day too, unless those who, under the influence of a similar spell, believe in these ridiculous claims under their scientific disguise and spend their lives defending them, abandon their superstitious beliefs, they also will be humiliated when the full truth emerges and the spell is broken. In fact, Malcolm Muggeridge, an atheist philosopher and supporter of evolution, admitted he was worried by just that prospect:

I myself am convinced that the theory of evolution, especially the extent to which it's been applied, will be one of the great jokes in the history books in the future. Posterity will marvel that so very flimsy and dubious an hypothesis could be accepted with the incredible credulity that it has.¹⁰¹

That future is not far off: On the contrary, people will soon see that "chance" is not a deity, and will look back on the theory of evolution as the worst deceit and the most terrible spell in the world. That spell is already rapidly beginning to be lifted from the shoulders of people all over the world. Many people who see its true face are wondering with amazement how they could ever have been taken in by it.

NOTES

- 1 *The Illustrated Encyclopedia of The Human Body*, Marshall Cavendish Books, London, 1974, p. 81
- 2 Arthur C. Guyton, John E. Hall, *Textbook of Medical Physiology*, 10. Edition, W.B. Saunders, p. 581.
- 3 *Biological Science: A Molecular Approach*, BSCS Blue Version, 6. Edition, Colorado 1990, p. 521
- 4 *The Incredible Machine*, Washington D. C. National Geographic Society, 1986, p. 226
- 5 *The Incredible Machine*, pp. 222, 225
- 6 *The Illustrated Encyclopedia of The Human Body*, p. 81
- 7 *Biological Science: A Molecular Approach*, p. 523
- 8 Terzioğlu Meliha, Oruç Tulin, Yigit Gunnur, *Fizyoloji Ders Kitabı* (Textbook of Physiology), İstanbul, I. U. Basımevi ve Film Merkezi, 1997 p. 399
- 9 *Body Atlas*, Ambrose Video Publishing, Inc. New York, Discovery Communications, 1994
- 10 Kemalettin Büyükoğlu, *İç Hastalıkları (Internal Diseases)*, İstanbul, Nobel Tıp Kitapevi, 1992, p. 392
- 11 Musa Özet, Osman Arpacı, *Biyoloji 2 (Biology 2)*, Surat Publishing, February 98, p. 126
- 12 *Biyoloji 2 (Biology 2)*, p. 126
- 13 *Body Atlas*, Ambrose Video Publishing, Inc. New York, Discovery Communications, 1994
- 14 *The Incredible Machine*, p. 222
- 15 *The Incredible Machine*, p. 241
- 16 *Biological Science: A Molecular Approach*, p. 521
- 17 *Biological Science: A Molecular Approach*, p. 521
- 18 *Biyoloji 2 (Biology 2)*, p. 127
- 19 *Biyoloji 2 (Biology 2)*, p. 129
- 20 Helena Curtis, Sue Barnes, *Invitation To Biology*, 4. Edition, New York, Worth Publisher, INC, August 1985, p. 472
- 21 *Biological Science: A Molecular Approach*, p. 517
- 22 Selahattin Kologlu, *Endokrinoloji Temel ve Klinik* (Basic and Clinical Endocrinology), p. 533
- 23 *Invitation To Biology*, p. 467
- 24 Eldra Pearl Solomon, *Introduction to Human Anatomy and Physiology*, W.B. Saunders, 1992, p. 140
- 25 *Biyoloji 2 (Biology 2)*, p. 133
- 26 Yenson Mutahhar, *İnsan Biyokimyası* (Human Biochemistry), Ankara, Gunes Kitabevi, 1995, p. 761
- 27 *İç Hastalıkları (Internal Diseases)*, p. 275
- 28 *Fizyoloji Ders Kitabı* (Textbook of physiology), 1997, p. 398
- 29 Cortisol: The "Stress Hormone" <http://stress.about.com/library/weekly/aa012901a.htm>
- 30 "Cortisone", <http://www.soton.ac.uk/~gk/scifi/cortisone.htm>
- 31 *Biyoloji 2 (Biology 2)*, p. 131
- 32 *Invitation To Biology*, p. 472
- 33 *İç Hastalıkları (Internal Diseases)*, p. 267
- 34 *İç Hastalıkları (Internal Diseases)*, p. 267
- 35 Oguz Kayaalp, *Rasyonel Tedavi Yonunden Tibbi Farmakoloji* (Medical Pharmacology According to Rational Treatment), Ankara, Feryal Matbaacılık, 1993, p. 2582

- 36 *Intimate Universe*, British Broadcasting Corporation - The Learning Channel Co-Production Video, 1998
- 37 *Rasyonel Tedavi Yonunden Tibbi Farmakoloji* (Medical Pharmacology According to Rational Treatment), p. 2751
- 38 *Rasyonel Tedavi Yonunden Tibbi Farmakoloji* (Medical Pharmacology According to Rational Treatment), p. 2723
- 39 *Ic Hastalıkları* (Internal Diseases), p. 369
- 40 *Rasyonel Tedavi Yonunden Tibbi Farmakoloji* (Medical Pharmacology According to Rational Treatment), p. 2750
- 41 *Rasyonel Tedavi Yonunden Tibbi Farmakoloji* (Medical Pharmacology According to Rational Treatment), p. 2750
- 42 *Rasyonel Tedavi Yonunden Tibbi Farmakoloji* (Medical Pharmacology According to Rational Treatment), p. 2750
- 43 *Ic Hastalıkları* (Internal Diseases), p. 392
- 44 *M. Encarta Encyclopedia 2000*, "Protein"
- 45 J.Schultz, R.R.Copley, T.Doerks, C.P.Ponting, P. Bork, "SMART: a web-based tool for the study of genetically mobile domains," *Nucleic Acids Research*, Vol.28, No.1, 2000, pp. 231-234
- 46 J.D. Scott, T. Pawson, "Cell Communication," *Scientific American*, June 2000, p. 76
- 47 *Scientific American*, June 2000, p. 76
- 48 "UT Southwestern Nobel Laureate Leads Bold Project Changing Way Scientists Conduct Research," *Science Daily Magazine*, 5 September 2000, <http://www.sciencedaily.com/releases/2000/09/000913204201.htm>.
- 49 Alliance for Cellular Signaling (AFCS), "I. Program Summary, D. Experimental Strategies, 2. Definition of Our Initial Sphere of Interest," 2000, <http://www.signaling-gateway.org/aboutus/ProgSummary.html>
- 50 "Making discoveries that transform science," The Rockefeller University, Office of Communications and Public Affairs, www.rockefeller.edu/pub/discoveries/conversation.php
- 51 The Nobel Foundation, "The Nobel Prize in Physiology or Medicine 1999, Introduction," 1999, <http://www.nobel.se/medicine/laureates/1999/illpres/intro.html>
- 52 Gunter Blobel, "Intracellular Protein Traffic," 2000, <http://www.hhmi.org/research/investigators/blobel.html>
- 53 Gunter Blobel, "Intracellular Protein Traffic," 2000, <http://www.hhmi.org/research/investigators/blobel.html>
- 54 The Nobel Foundation, "Press Release: The 1999 Nobel Prize in Physiology or Medicine," 1999, <http://www.nobel.se/medicine/laureates/1999/press.html>
- 55 Howard Hughes Medical Institute, "Gunter Blobel Wins 1999 Nobel Prize for Physiology or Medicine," 1999, <http://www.hhmi.org/news/blobel.html>
- 56 R.T. Batey, R.P. Rambo, L. Lucast, B. Rha, J.A. Doudna, "Crystal structure of the ribonucleoprotein core of the signal recognition particle," *Science*, 18 February 2000, vol. 287, no. 5456, pp. 1232-1239
- 57 Jennifer A. Doudna, "RNA Catalysis, RNA Processing, and Translation," 2000, <http://www.hhmi.org/research/investigators/doudna.html>
- 58 YALE News Release, "Yale Researcher Identifies Structure of Molecular Zip Code Reader," 2000, <http://www.yale.edu/opa/newsr/00-02-17-01.all.html>
- 59 The Rockefeller University News, "Rockefeller University Cell Biologist, Gunter Blobel, Wins 1999 Nobel Prize in Physiology or Medicine," 1999, <http://www.rockefeller.edu/pubinfo/blobel.nr.html>

- 60 E. Conti, M. Uy, L. Leighton, G. Blobel, J. Kuriyan, "Crystallographic Analysis of the Recognition of a Nuclear Localization Signal by the Nuclear Import Factor Karyopherin alpha," *Cell*, July 1998, vol. 94, pp. 193-204
- 61 Online NewsHour, "Nobel Prize for Medicine," 11 October 1999, http://www.pbs.org/newshour/nobel_1999/blobel.html
- 62 Eric H. Chudler, "The Hows, Whats and Whos of Neuroscience," 2001, <http://faculty.washington.edu/chudler/what.html>
- 63 M.J. Farabee, "Online Biology Book: The Nervous System," 2000, <http://www.emc.maricopa.edu/faculty/farabee/BIOBK/BioBookNERV.html>
- 64 J.P. Changeux, P. Ricoeur, "What Makes Us Think?," Princeton University Press, 2000, p. 78
- 65 G. Fischbach, "Dialogues on the Brain: Overview," The Harvard Mahoney Neuroscience Institute Letter, 1993, vol. 2
- 66 M. Chicurel, C.D. Franco, "The Inner Life of Neurons," The Harvard Mahoney Neuroscience Institute Letter, 1995, vol. 4, no. 2
- 67 The Nobel Foundation, "Press Release," 9 October 2000, <http://www.nobel.se/medicine/laureates/2000/illpres/kandel.html>
- 68 E. Kandel, J.H. Schwartz, T.M. Jessell, *Principles of Neural Science*, McGraw Hill Publishing, 2000, p. 277.
- 69 Eric H. Chudler, "Making ConnectionsThe Synapse," 2001, <http://faculty.washington.edu/chudler/synapse.html>
- 70 *Principles of Neural Science*, p. 176
- 71 Axel Brunger, "Neurotransmission Machinery Visualized for the First Time," 1998, <http://www.hhmi.org/news/brunger.html>
- 72 Eric H. Chudler, "Brain Facts and Figures," 2001, <http://faculty.washington.edu/chudler/facts.html>
- 73 Lionel Bender, *The Human Body:Its Mysteries and Marvels*, Crescent Books, 1992, p. 60.
- 74 D.E. Koshland, "The Molecule of the Year," *Science*, no. 258, 18 December 1992, pp. 1861-1865
- 75 The Nobel Assembly at Karolinska Institute, "Press Release: The 1998 Nobel Prize in Physiology or Medicine," 12 October 1998, <http://www.nobel.se/medicine/laureates/1998/press.html>
- 76 The Nitric Oxide Society, "The Nitric Oxide Home Page," 2000, <http://www.apnet.com/no/>
- 77 R.H. Epstein, "Puff the Magic Gas," *Physician's Weekly*, vol. XIII, no. 31, 19 August 1996
- 78 J. Cooke, "Magic Molecule," 12 October 1998, [http:// www.pbs.org/newshour/bb/science/july-dec98/nobel_10-12.html](http://www.pbs.org/newshour/bb/science/july-dec98/nobel_10-12.html)
- 79 *M. Encarta Encyclopedia 2000*, "Circulatory System"
- 80 "What is Nanotechnology?," *Nano Technology Magazine*, November 2001, www.firststagecapital.com/pdf/FSCNanotechnologyReport.pdf
- 81 D. Epel, "Scientists discover key ingredient in sexual reproduction," Stanford University News Service, 2000, <http://www.stanford.edu/dept/news/report/news/august9/sperm-89.html>
- 82 Sidney Fox, Klaus Dose, *Molecular Evolution and The Origin of Life*, W.H. Freeman and Company, San Francisco, 1972, p. 4.
- 83 Alexander I. Oparin, *Origin of Life*, Dover Publications, New York, 1936, 1953 (reprint), p. 196.
- 84 "New Evidence on Evolution of Early Atmosphere and Life", *Bulletin of the American Meteorological Society*, vol 63, November 1982, p. 1328-1330.

- 85 Stanley Miller, *Molecular Evolution of Life: Current Status of the Prebiotic Synthesis of Small Molecules*, 1986, p. 7.
- 86 Jeffrey Bada, *Earth*, February 1998, p. 40
- 87 Leslie E. Orgel, "The Origin of Life on Earth", *Scientific American*, vol. 271, October 1994, p. 78.
- 88 Charles Darwin, *The Origin of Species by Means of Natural Selection*, *The Modern Library*, New York, p. 127.
- 89 Charles Darwin, *The Origin of Species: A Facsimile of the First Edition*, Harvard University Press, 1964, p. 184.
- 90 B. G. Ranganathan, *Origins?*, Pennsylvania: The Banner Of Truth Trust, 1988, p. 7.
- 91 Charles Darwin, *The Origin of Species: A Facsimile of the First Edition*, Harvard University Press, 1964, p. 179.
- 92 Derek A. Ager, "The Nature of the Fossil Record", *Proceedings of the British Geological Association*, vol 87, 1976, p. 133.
- 93 Douglas J. Futuyma, *Science on Trial*, Pantheon Books, New York, 1983. p. 197.
- 94 Solly Zuckerman, *Beyond The Ivory Tower*, Toplinger Publications, New York, 1970, pp. 75-14; Charles E. Oxnard, "The Place of Australopithecines in Human Evolution: Grounds for Doubt", *Nature*, vol 258, p. 389.
- 95 "Could science be brought to an end by scientists' belief that they have final answers or by society's reluctance to pay the bills?" *Scientific American*, December 1992, p. 20.
- 96 Alan Walker, *Science*, vol. 207, 7 March 1980, p. 1103; A. J. Kelso, *Physical Antropology*, 1st ed., J. B. Lipincott Co., New York, 1970, p. 221; M. D. Leakey, *Olduvai Gorge*, vol. 3, Cambridge University Press, Cambridge, 1971, p. 272.
- 97 Jeffrey Kluger, "Not So Extinct After All: The Primitive Homo Erectus May Have Survived Long Enough To Coexist With Modern Humans," *Time*, 23 December 1996.
- 98 S. J. Gould, *Natural History*, vol. 85, 1976, p. 30.
- 99 Solly Zuckerman, *Beyond The Ivory Tower*, p. 19.
- 100 Richard Lewontin, "The Demon-Haunted World," 71 Malcolm Muggeridge, *The End of Christendom*, Grand Rapids:Eerdmans, 1980, p. 43.
- 101 Malcolm Muggeridge, *The End of Christendom*, Grand Rapids:Eerdmans, 1980, p. 43.